HARMAN International

Supplier Quality Manual

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Management Message

The Car industry with its entire value stream is increasingly facing challenging as well as exhilarating times. Product life-cycles are getting shorter while time-to-market is expected to be minimized. Purchase demands and capacity availability are becoming more volatile and deliveries are expected to satisfy demands with the highest degree of flexibility and just-in-sequence. All the while and to achieve synergies, becoming global is a must in our industry and adds to the equation more challenges and at every juncture of this value stream.

Those challenges are coupled with highest expectations for quality performance and cost competitiveness. This combination of expectations and mandatory requirements could only be achieved by applying the most effective and efficient processes that spans the entire product lifecycle management (PLM).

In this value stream it is not enough for us to have Best-In-Class processes. At HARMAN we fully realize that for our organization to achieve its customer quality commitment, we must be able to rely on our supply base to deliver defect free products.

Problems along the value stream should not be solved, they should be avoided as it is less efficient to fix problems down-stream. Loss of time, loss of money, and most importantly loss of reputation and future business is at risk when we are unable to proactively manage our delivered quality.

We firmly believe that our success in the automotive space is heavily contingent on our supplier's ability to meet and in most cases exceed quality expectations. Therefore, HARMAN and across all of its functions will maintain and increased level of focus on Supplier delivered quality. HARMAN will employ proven tools that will assist in achieving better performance and compliment its quality objectives e.g. Advanced Product Quality Planning (APQP), Run@Rate (R@R) and Safe Launch Plan (SLP). These activities are designed to drive for better interface and communication between HARMAN and supplier management. We maintain that for our relation to be fully effective Quality, Purchasing, Engineering and Logistic need to have greater level of collaboration and interface on new programs as well as running products.

The cooperation between HARMAN and its suppliers could only be successful, if we both were to pull on the same and right side of the rope. **Your success is ours. Our success is yours.**

Elmar Smolin- SVP, Supplier Chain Management

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1 Preface

The high expectations and standards placed by HARMAN International and its customers on the quality of the products and delivery performance require high supplier capability. Fundamental to the common success for supplier, customer and HARMAN is target-oriented partnership based cooperation between HARMAN and the supplier.
HARMAN expects not only a 0-error philosophy from suppliers, but also excellent performance regarding delivery performance, cost competitiveness, technological support, best-in-class problem solving process and cooperation /communication.
This Supplier Quality Manual (SQM) describes the expectations placed by HARMAN on its suppliers regarding quality and delivery performance, as well as the formalities and processes which must be followed in partnership with HARMAN. Quality and environment-relevant processes from concept phase to series production or series delivery of supplied parts are detailed within.
Supplier shall establish document, implement and maintain a management system in accordance with HARMAN requirements and applicable international quality, environmental and safety standards.

1.1 Scope

These requirements are valid for all suppliers of HARMAN who deliver production material that will directly impact the quality of HARMAN final product. These guidelines are valid for all HARMAN locations, worldwide.
NOTE: In this document, HARMAN International will be referred to simply as HARMAN.

1.2 Supplier Quality Engineering (SQE) and Assurance (SQA) Activities along the Product Lifecycle Management (PLM)

The Procurement and Supplier Quality Engineering (SQE) organizations of HARMAN are organized globally. The SQE department is responsible for preventive and pre-production quality assurance activities for purchased parts. During mass production, all quality assurance activities, e.g. incoming inspection, handling of complaints and so on will be handled through the Supplier Quality Assurance (SQA) group. This means, that once the parts are PPAP approved, SQA becomes responsible for managing, monitoring and reporting of supplier performance.
As shown on figure 1, the SQE and SQA organizations have many interactions with the supplier to guarantee the quality of supplied products throughout the entire Product Lifecycle.

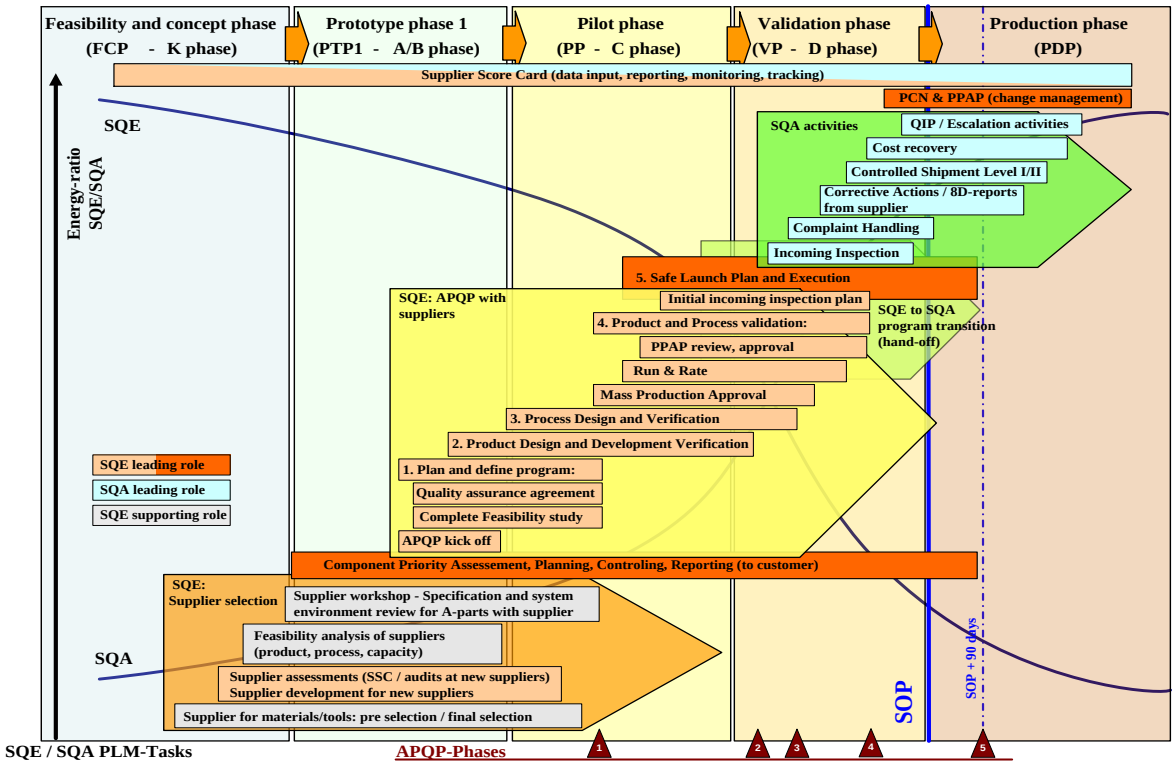

Figure 1: SQE / SQA PLM-Tasks

1.3 Revision of this Supplier Quality Manual available on Internet Portal

This manual will be reviewed and updated on a regular basis. The latest released version is available to all suppliers at the HARMAN Supplier Portal. The current web location for this site is:

http://www.harman.com/supply-chain

1.4 General Requirement (Language)

All supplier documentation submitted to HARMAN must be issued in English. For HARMAN internal product transfers from one HARMAN location to another HARMAN location, documentation previously submitted in languages other than English must be resubmitted in English.

2 Management Systems

2.1 Quality Management System

All parties concerned must contribute towards achieving and implementing the objectives of the HARMAN quality policy and quality principles and must promote continual improvement.
Our suppliers must undertake to introduce, to apply, to uphold and to provide information on a quality management system which complies with the requirements ISO/TS 16949 or at least, those of ISO 9001. in the actual valid revision. Suppliers must inform HARMAN of changes of the status of their quality management system certification not later than one month after this change.

The supplier shall adhere to requirements and procedures defined in followings

- Advanced Product Quality Planning and Control Plan (APQP),
- Production Part Approval Process (PPAP),
- Potential Failure Mode and Effects Analysis (FMEA),
- Measurement System Analysis (MSA),

- Statistical Process Control (SPC),
- VDA volume 2 - Quality Assurance of Supplies,
- VDA Volume 4.2: Quality Assurance in the process landscape - Product and Process FMEA,
- VDA volume 5 – Capability of Measurement Processes
- VDA volume 6.3 - Process-Audit.
- VDA Field Failure Analysis
- VDA Product creation – A process description covering special characteristics(SC)

Suppliers must also guarantee that sub-suppliers have provided for adequate quality-assurance measures and will commit themselves to fulfilling their obligations per this Supplier Quality Manual. Suppliers to HARMAN are solely responsible for all purchased sub components used in their products, even if the sub-supplier or subcomponent was directed by HARMAN.

2.2 Environmental Management System

HARMAN has established an environmental management system in accordance with ISO 14001 requirements. The HARMAN environmental policy contains a commitment to continuously improve environmental performance and to prevent environmental pollution and uphold relevant laws and regulations. HARMAN transfers this self-commitment to all suppliers.
HARMAN, therefore, requires its suppliers to develop and uphold an environmental management system and to undertake continual improvement. Suppliers must inform HARMAN of changes of the status of their environmental management system certification not later than one month after this change.

2.3 Protection against Electrostatic Discharge – ESD-Certification

Electronic components can be damaged through electrostatic discharge. To implement and to monitor overall suitable protection measures, it is necessary to apply expert knowledge. HARMAN requires applicable suppliers/manufacturers to strictly adhere to norms and regulations, such as ANSI/ESD 20/20 or IEC61340 and shall perform/demonstrate continuous improvement to maintain the ESD control system. Suppliers must inform HARMAN of changes of the status of their ESD certification not later than one month after this change.

2.4 Reach Compliance

The Regulation (EC) Nr. 1907/2006 (REACH-Regulation) is an EC-Regulation on chemicals. This regulation became active on June 1, 2007. REACH stands for Registration, Evaluation, Authorisation and Restriction of Chemicals.
Suppliers shall comply with all applicable REACH requirements that affect the products that they supply to HARMAN. HARMAN expects that suppliers will have a dialogue with HARMAN and with their own supply chain regarding all applicable aspects of the REACH-regulation.

2.5 Regulatory Compliance

In general, HARMAN expects that all suppliers comply with all applicable national and international legal requirements.

2.6 Product Safety Officer (PSO)

The supplier shall appoint Product safety Officer who acts as a central point of contact to HARMAN. One PSO shall be designated per supplier’s production plant. This requirement needs to be cascaded down to entire supply chain.

2.6.1 Knowledge

The PSO shall have proven knowledge about
- Functionality of the supplied component, the details of production at own site and proper use in the vehicles or with the respective subsequent client in the supply chain (Tier 2 and subsequent Tiered suppliers). If necessary, material usage recommendations (e.g. raw materials, materials) must be coordinated and agreed within the aforementioned requirement.
- Product Safety Act and the Product Liability Act.
- Risks Assessment methods and their application.

Based on this, a suitable, supplier-specific training concept can be set up for the qualification of multiple product safety representatives within the scope of a company-specific PSB network, provided that comparable content is conveyed, comprehended, and documented accordingly.

2.6.2 Tasks

The PSO does have following tasks

- Contributing to, developing, and setting priorities for eliminating or preventing product safety-relevant defects in the product development phase (error prevention).

- Working independently, initiating and verifying product, process, and engineering-relevant decisions in the course of product development and additional product enhancement (e.g. FMEA or risk assessment procedures) provided that there is an impact relevant to safety.

- Preparing, maintaining, and enhancing “lessons learned” checklists for the qualified review of designs, production, processes, or for the material properties under product-safety relevant aspects.

- Executing or initiating and assessing component or material analyses with the goal of detecting indications of deviations relevant to product safety at an early stage.

- Independently executing or initiating regular inspections of processes, production, material, and products of the current series for the confirmation of product safety for proper and predictable use or misuse and the introduction as well as tracking of (immediate) measures in the case of relevant deviations.

- Assessing the probability and frequency of failure of the affected product in the event of failure.

- In the event of a complaint, the planned remedial measures, their implementation and long-term effectiveness shall be verified. The effectiveness of the measures shall be reviewed, confirmed, and documented in writing by the supplier PSO.

- In the event of a complaint or voluntary declaration, communication shall be directed via the person responsible for component QA. The respective contact persons shall be determined in advance for downstream clients in the supply chain (tier N).

Reference Q-Alert
- The PSO shall advise with respect to the quality and confidentiality of the information (clear information regarding the error pattern, limitation, probability of failure, etc).

2.6.3 Competencies

The PSO should report directly to management, the plant manager or the quality assurance manager. The PSO should be able to initiate the blocking of components or materials of the current series in the event of safety and image-relevant complaints, etc. (also if these threaten series application for reasons of safety), including resource control with regard to bench tests, validation, analyses, etc.

3 Supplier Approval

HARMAN has a defined procedure for selecting and evaluating new suppliers.
A supplier may be the manufacturer of the product to be delivered or a distributor of products as appointed by the manufacturer. The target is to use a supplier only after it has been established that they can fulfil HARMAN requirements. Depending on the product for which the supplier is to be sourced, specific documentation may be required from the supplier and other activities may be introduced.
At HARMAN´s discretion a potential supplier may be requested to perform a self assessment according to HARMAN´s audit procedure or applicable industry standards (e.g. VDA 6.3). The supplier provides a report of the observations and findings during the self assessment to HARMAN. In case of a subsequent HARMAN audit supplier´s self assessment report will be used as a baseline document

A corrective action plan must be generated for the findings at the self assessment as well as for the findings at the HARMAN-audit. HARMAN reserves right to delegate the execution of a HARMAN audit to a third party chosen by HARMAN. The supplier should provide reasonable access for supplier facilities. Further information regarding Audits is given in chapter 5.4.8.

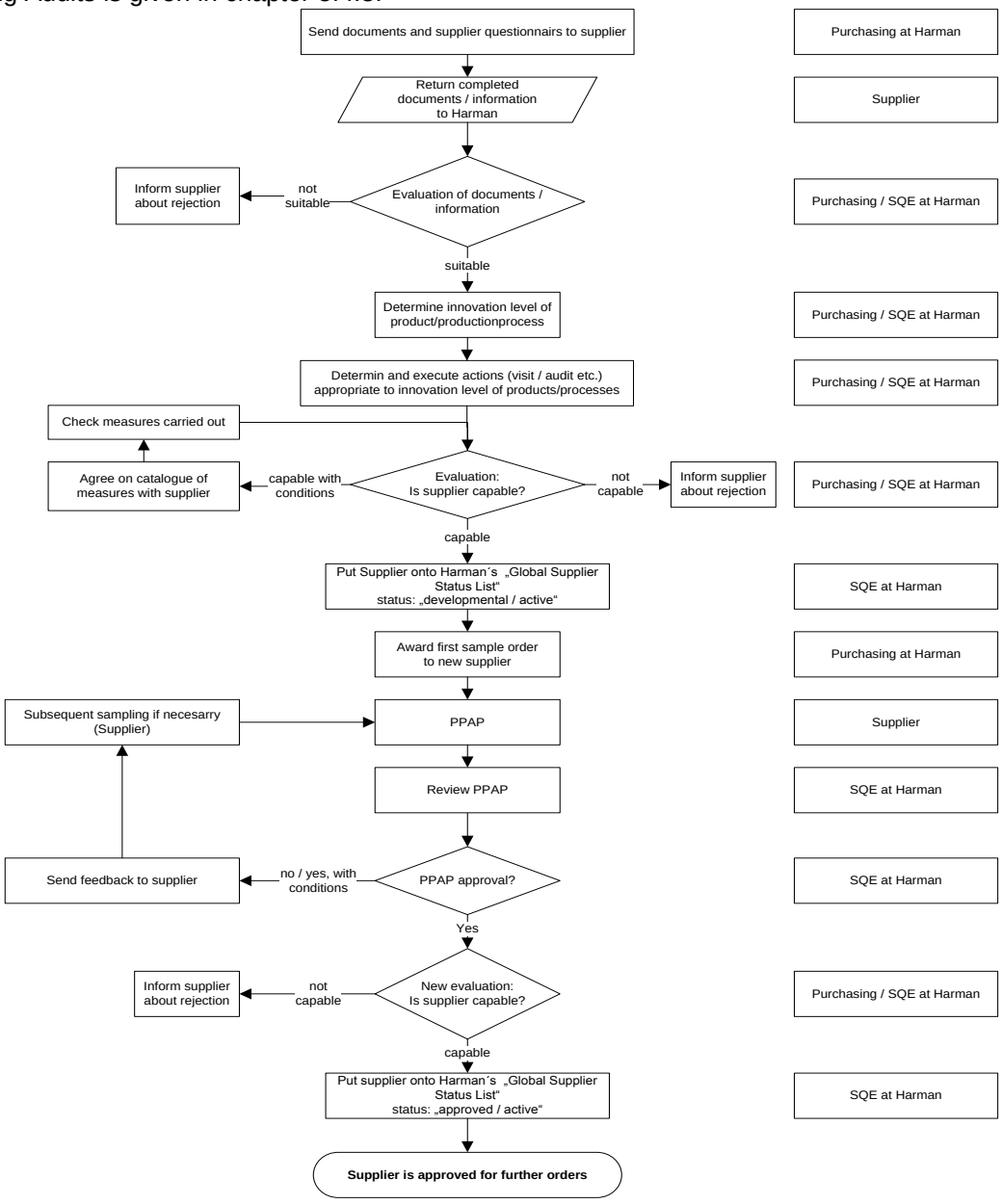

Figure 2: Supplier approval process

The supplier is approved for use only after positive results from an overall evaluation. Once approved, a sample order may be placed with the supplier. If this order result is positive and finally approved via PPAP, the supplier approval will be considered complete. For further business HARMAN Supplier-Management-Team will select the supplier according to the supplier selection process. The supplier will be informed in the event of non-acceptance. HARMAN will inform the supplier of the result of the approval process. In case the approval is denied, the supplier may be granted a defined timeframe to implement improvements and to reapply for approval. A supplier approval given by HARMAN does not imply an obligation for HARMAN to place any orders at the respective supplier.

4 Supplier Blocking

HARMAN has a defined procedure for blocking a supplier. All departments at HARMAN can initiate the process for blocking a supplier. Reasons for applying for blockage could be, e.g.:

- Insufficient quality performance,
- Insufficient supply performance,
- Insufficient project work,
- Ineffective Controlled Shipping level 2 (see chapter “Controlled Shipping”),
- Repeatedly bad rating (C or B) with regards to the supplier evaluation without any recognisable improvement (see chapter “Supplier Evaluation”),
- No improvements from implemented supplier development activities,
- No improvement after execution of Supplier Quality Improvement Plan – SQIP.

5 Quality Assurance in all Phases of Cooperation

In all phases of cooperation, from concept-phase to product and process development-phases, and finally to mass production, all necessary actions to assure quality need to be performed at the supplier.

5.1 Quality Assurance in the Concept Phase

In the concept phase, the supplier is obligated to check the requirements from HARMAN with respect to product requirements, time schedule, capacity and quality targets (PPM) for feasibility.
The supplier shall complete a feasibility study and provide the results to HARMAN Procurement using the HARMAN Form F1834959 if requested.

5.2 Quality Assurance in the Phase of Product- and Process-Development and Verification

5.2.1 Determination of special Product- and Process-Characteristics

During product and process development, the supplier must consider special characteristics as defined by HARMAN. These special characteristics may relate to product, process or both. In addition to special characteristics specified by HARMAN, the supplier must identify characteristics deemed critical to the design or process which are critical. In case that the special product characteristics are not given by HARMAN, the supplier must identify special characteristics on its own. The special characteristics must be highlighted in appropriate documents, like FMEA, control-plan, etc. Special product characteristics should be guaranteed with one of the following methods: systematic failure avoidance (Poka Yoke), 100% inspection, statistic process control (SPC), process capability monitoring, and Measurement system analysis for testing and measurement equipments.
For customer designated special characteristics as noted on HARMAN drawings or specifications, quality records must be retained by the supplier for 100% of the product produced. These records must be made available to HARMAN upon request.

5.2.2 Measures for Quality Assurance in the Phase of Product- and Process-Development

During the product and process development phase, the supplier is expected to mitigate risk by utilizing risk rating and risk management tools. The goal is to ensure that from the start of mass-production until end of mass-production the delivered components comply with the specification and are produced with controlled and capable processes. Applicable risk management tools are:

- APQP
- PPAP
- Sub-supplier development and management
- Mass Production Approval (MPA)
- Safe Launch Plan (SLP)
- …

5.2.2.1 Communication in the Phase of Product- and Process-Development

Individuals from engineering, procurement and SQE at HARMAN will be assigned to be the contact to the supplier in the phase of product and process-development. The supplier shall forward a project/organization chart to HARMAN that shows the persons and respective competences of the team involved in the project that will interact with the respective HARMAN team members. However it is assumed that it is the project manager at the supplier who is to be held responsible for the overall coordination and the respective activities.

5.2.2.2 APQP

On-time approval of Production Part Approval Process documents (PPAP) must be guaranteed through the use of an APQP process. All relevant activities must be scheduled, executed and verified. The project plan must include proper risk mitigation activities and back-up plans. In case of schedule delays or development issues, a suitable recovery plan must be crafted and executed leading to project success.
Project scope, division of responsibilities, technical requirements and project schedule should be determined as early as possible. For component being classified by HARMAN as critical, the Project progress will be tracked against the agreed upon schedule using the HARMAN APQP workbook. These project audits may be done either during a meeting or, if applicable, through a review of respective documents.

5.2.2.3 Maturity Assurance

Beyond the use of APQP, the supplier is expected to utilize comprehensive program management tools to ensure product and process maturity are in line with the HARMAN program development plan. The HARMAN APQP guidelines specify gateway reviews which summarize progress at key program milestones. The supplier is expected to manage development activities to ensure completion of critical tasks and supporting sub-tasks such that project status remains as planned (green). The supplier shall provide frequent updates on project status. In case of a critical task suffer a delay, immediate notification to HARMAN is required.

5.2.2.4 Mass Production Approval (MPA)

In the course of Production Part Approval Process (PPAP), a Mass Production Approval shall be executed at the supplier. The HARMAN MPA tool will be used for this. During the MPA, HARMAN and potentially the HARMAN's customer require full access to all areas referenced in the Control Plan at the supplier's manufacturing location.
During the MPA, products shall be produced with production conditions at the supplier. Production rate, first pass yield and final yield will be measured during the MPA production run. According to the findings and the overall result of the MPA, corrective actions requests will be presented to the supplier by HARMAN. If necessary a follow up audit to verify corrective actions will be arranged.
Build quantity of the MPA will be determined by the HARMAN Supplier Quality Engineer prior to the build. In most cases, 300 pieces (minimum) or a single production shift will be required.

5.2.2.5 Run@Rate

Typically a Run @ Rate will be performed together with the MPA. The HARMAN Run@Rate tool (F2151243 – Run@Rate Workbook for HARMAN Suppliers) will be used for this. The purpose of this activity is to verify that the supplier's actual manufacturing process, while operating under mass production operating conditions, is:

a) Capable of producing quality components per HARMAN requirements,
b) Capable of meeting or exceeding the contracted capacity on a sustained basis.

The Run@Rate could be either executed by HARMAN SQE or by the supplier itself according to the HARMAN procedure with the help of the respective HARMAN templates.

5.2.2.6 Production Part Approval Process (PPAP)

5.2.2.6.1 In General

The PPAP - procedure shall provide evidence that all requirements in the drawings and specifications are met and that the product is produced with a controlled and capable process. The PPAP submission must be made and approved by HARMAN before the start of mass production. All changes in product or process that are required for approval as defined in AIAG/VDA must be PPAP approved. The PPAP procedure is the final verification for the product and the production process leading to the final approval for mass production. The PPAP procedure must be done according to the regulations given by the current revision of the AIAG PPAP manual.

In general, Supplier is expected to complete PPAP Level 3.

Applicable PPAP submission levels are as follows:

1. Custom Parts – Custom parts are those which are fully defined by HARMAN released prints. These maybe unique parts or catalogue parts with modifications. Custom parts require the submission of a full level 3 PPAP.
2. Catalogue or Off-The-Shelf Parts – Catalogue parts are those which are fully defined by supplier prints and for which HARMAN does not specify changes to either design or process parameters. For catalogue parts, only a level 4 PPAP needs to be submitted to HARMAN. The specific requirements for this level 4 PPAP will be given either by a commodity specific template “PPAP requirement” or individually by the assigned HARMAN SQE. At least the PSW must be submitted to HARMAN.
3. Critical Components – Critical components will be defined by HARMAN. Those components which are rated as critical will require APQP reporting. During the APQP process, the HARMAN SQE, along with the supplier, will determine PPAP requirements.

HARMAN defines commodity specific PPAP requirements. The procurement will forward those requirements to the supplier along with the purchase order if applicable. These templates should be used by the supplier, procurement and finally SQE as a list to check PPAP contents and completeness.

Sample delivery dates will be communicated to the supplier via the purchase order (P.O.). Upon the delivery date of the PPAP order, the supplier must forward all documents for PPAP and samples to HARMAN. For this, templates according to PPAP (AIAG) must be used. All requirements for dimensions and product specifics, which are given by the product specification, must be verified and documented. It is expected, that PPAP samples meet all specification at the time of PPAP delivery specified in the P.O. Design and process iterations for development purposes must be scheduled into the program schedule such that they occur prior to the PPAP delivery date. Should product or process changes (including corrections for dimensional deviations) be executed after the PPAP delivery, all requirements for dimensions and product specifics must be verified again. Variations for this must be agreed together with the assigned HARMAN SQE.

If the qualification is not complete and approved prior to the target date or is repeatedly done in an insufficient manner, HARMAN has the right to appoint an external agency for the completion of the qualification. This is specifically cited with regard to the physical measurement of the parts. In this case, the supplier will bear the costs incurred for these services.

5.2.2.6.2 International Material Data System (IMDS)

To make the declaration of substances in the component material, data must be entered (published) into the International Material Data System (IMDS) or have to be sent via IMDS to the HARMAN accounts which defined at HARMAN IMDS supplier guideline. Further information for this can be found at www.mdsystem.com. The reference ID-number from IMDS must be included on the PSW form. Failure to complete this entry on the PSW will result in PPAP rejection.

5.2.2.6.3 Approval

HARMAN Supplier Quality Engineering is solely responsible for the disposition of PPAP submissions. Three PPAP statuses are possible:

Approved => Deliveries of parts are approved.

Interim Approved => In cases where the parts meet requirements but there may be additional data required or minor issues with the PPAP submission, e.g. lack of process capabilities, marginal GR&R, the Supplier Quality Engineer may approve the PPAP but require the supplier to provide containment actions with 100% inspection/test plan and corrective action related to the observed issue to grant full PPAP approval. HARMAN SQE permits shipment of material for production requirements on a limited time or piece quantity, the supplier shall regard as a temporary approval until the information is received and approved by the HARMAN Supplier Quality Engineer. Any additional or improved documentation must be submitted with a revised PSW to HARMAN SQE.

Rejected => Delivery of mass production parts is not allowed. A new PPAP submission is required. If nevertheless parts are required, the supplier shall submit Deviation Approval Request to HARMAN. (See section in 5.4.10)

The supplier and the responsible buyer at HARMAN will receive a copy of the signed PSW page from the Supplier Quality Engineer.
As noted previously, PPAPs will not be approved with data showing that parts do not meet all specifications and requirements. If engineering or other issues exist that need to be negotiated, approved, or modified, then a PPAP will not be approved until these issues are resolved and all documentation supports the configuration of the parts as submitted for PPAP.

5.3 Quality Assurance in the Launch Phase

HARMAN expects from its suppliers additional quality assurance measures during the launch phase. This is necessary in order to guarantee the quality of the parts in this critical phase.

5.3.1 Safe Launch at the Supplier

The safe launch at the supplier will be achieved through additional and extra activities. To ensure a safe launch, the supplier shall implement extra activities such as 100% inspection, tightened sampling schemes, tight control limits, increased numbers of inspection steps, tighten inspection/test criteria, etc.
Related Safe launch quality data such as process records, inspection results, Yield data, Failure analysis results and effectiveness of countermeasures on failures during safe launch period shall be regularly evaluated using statistical method. These additional quality assurance activities should be ongoing until a quality target, defined in advance, is achieved and sustainable.

For components, which are classified by HARMAN as critical component, the procedure “Safe Launch Plan” (SLP) (PSP06-P-008 – Safe Launch Plan for HARMAN Suppliers) will be applied. This procedure describes the selection of SLP activities, the monitoring and reporting of the quality levels as well as the procedure to stop these SLP activities.

5.3.2 Safe launch at HARMAN

HARMAN reserves the right to request on-site presence of a supplier resident quality engineer during the launch phase. If necessary, person should be onsite to monitor the process at the HARMAN plant. In case of any fault occurrences, Resident engineer should be able to start and support the problem solving process as soon as possible.

5.4 Quality Assurance in the Phase of Mass Production

- With the support of applicable quality tools, the supplier must guarantee that supplied products meet the required and stipulated quality targets during the complete phase of mass production.
- Supplier shall continuously monitor process capability for all special characteristics. Records of these shall be made available to HARMAN upon request.
- In case of an identified quality setback, supplier shall investigate the root cause(s) and identify and implement containment action and corrective action to avoid any negative impact on supplies to HARMAN. HARMAN expects to be informed by supplier proactively about those issues. HARMAN reserves to request an 8D report irrespective of the impact of the quality setback.
- Quality setbacks may include
  - Negative result in ongoing reliability monitoring
  - Epidemical fails observed on same or comparable products at other customers (epidemical fails are assumed when ppm-rate target agreed with HARMAN is exceeded by factor 3 related to a specific datecode, lotcode, …)
- Process capability for any identified critical characteristic falls below the Cpk value of less than 1.67
- Process capability for any identified critical characteristic falls below 75% relative to Cpk value reported to HARMAN in the PPAP
- Overall production and test yield falls significantly lower than that observed and reported during MPA and Run@Rate influencing the supply situation for HARMAN.

Supplier shall notify any event of quality set back to HARMAN plant SQA.

5.4.1 Quality Assurance in Mass Production with the Execution of Statistic Process Control (SPC)

With the help of SPC for specific product and process characteristics it must be proven that the product is produced with capable and controlled processes. For the machine capability c_{mk} as well as for process capability c_{pk} the value of ≥ 1.67 must be maintained and verified. In the case of capability values of ≥ 1,67 cannot be achieved, a 100% inspection is required. AIAG/VDA standards provide requirements and methods for the calculation of capability.

5.4.2 Control of faulty products at suppliers

The Supplier must insure that all Non-Conforming Product is clearly labelled and segregated in all processes and areas of the Supplier's operation.
Systems must exist to positively insure that Non-Conforming Product is not inadvertently used in production or shipped to HARMAN or its customers. No rework will be allowed except as given in section 5.4.9.

5.4.3 Control of faulty products at HARMAN

Supplier discover that there is a possibility that Non-Conforming Material has been delivered to HARMAN, the Supplier is responsible to:

- Immediately inform plant SQA to which the suspect material has been shipped. This notification cannot be considered complete until a written response has been received from all HARMAN facilities involved.

This notification must have preliminary information with “Q-alert” first and followed by 7D or 8D format Corrective Action Report. Those disciplines which are not yet complete must be presented as planned activities with milestones and supporting subtasks.

5.4.4 Complaint Handling, Failure Analysis and Problem Solving

5.4.4.1 Introduction

HARMAN suppliers are responsible for providing defect-free product on time and at the specified quantities to HARMAN and ultimately our customers. When quality or delivery issues do occur, the supplier is required to initiate problem-solving, containment and corrective action to resolve the issue and prevent recurrence.
This section covers the HARMAN specific requirements for problem-solving, containment and corrective action reporting. It is designed to guide HARMAN suppliers in the development of a corrective action system that will meet HARMAN’s minimum requirements. It is to be used in conjunction with ISO/TS16949 (Section 8.5.2.1 thru 8.5.2.3) and follow the 8D approach as defined by VDA (VDA Volume “Standard Process for handling Customer Complaints”).
HARMAN requires that a systematic, team-oriented problem-solving method be utilized. The team is required to implement short-term and long-term corrective action plans and verify the effectiveness of the corrective action taken to prevent recurrence using statistical methods. Supplier shall involve its sub-suppliers into the problem solving process as needed and ensure that all parties of the supply chain meet HARMAN´s requirements accordingly.

5.4.4.2 Schedule/Timeline Requirements

HARMAN will notify supplier of defective material using HARMAN´s quality notification system. HARMAN will indicate where the reported failure was first observed: in HARMAN Incoming Inspection or Production/Test, at Automotive OEM Production or during use at end customer.
Timeline requirements

- Immediately after receiving initial complaint information from HARMAN, supplier shall identify immediate containment action(s).
- If requested by HARMAN, supplier shall ensure availability of a resident engineer at the affected HARMAN plant latest 48 hours after the initial notification was issued.
- If supplier´s return process requires an RMA for return shipments, supplier shall provide the RMA to HARMAN within one working day after the initial notification was issued.
- Supplier shall initiate its internal problem solving immediately after receiving the notification from HARMAN and establish an internal problem solving team.
- Within 2 working days after receiving notification from HARMAN, supplier shall provide an initial containment action report. By this time the disciplines D1 thru D3 should be completed by supplier and the results shall be included in the report.

- Within 10 working days after receiving defective parts – or alternatively a comprehensive failure information (e.g. dimensional reports, pictures, error-logs…) - from HARMAN, supplier shall provide a final 8D report. By this time also the disciplines D4 thru D7 shall be completed by supplier and the results shall be included in the report.
- If supplier is not able to provide a final 8D report within 10 working days, an interim report has to be provided. Additionally supplier shall provide a detailed time-schedule for completing the 8D.
- If permanent corrective actions include design changes or major process changes that are subject to the PCN approval, HARMAN recognizes that the final implementation of these actions may be depending on factors outside supplier´s direct influence. In those cases completion of D6 may be delayed to a date agreed with HARMAN in advance.

5.4.4.3 Containment Action

Immediate containment action shall ensure that further shipment of affected parts to HARMAN is avoided and affected parts at HARMAN or within the supply chain can be identified and segregated.
Supplier shall identify the range of product that may be affected in terms of serial number range, datecode or identification of affected shipments. Supplier shall provide information about the potentially affected product range latest within the 3D report and actualize this information continuously based on findings during failure confirmation and FA.
Supplier shall ensure that the supply to HARMAN will not be disrupted. This may be achieved by implementing appropriate additional inspections that can effectively screen-out affected parts or by rework of affected parts.
Supplier shall define and document those processes in work instructions and control plan and provide sufficient training to all operators involved.
Supplier shall ensure that all reworked products meet the applicable specification requirements and successfully pass all tests and inspections defined in the serial production control plan.
Supplier shall ensure that all reworked parts can be identified by serial number or marking of individual parts, packing units and shipment containers. Markings have to be agreed with HARMAN in advance.
All rework activities (except those that have been approved by HARMAN within APQP/PPAP) are subject to approval by HARMAN. For this purpose HARMAN reserves to request submission of all related documents and records by supplier as well as an on-site process review at supplier.
HARMAN reserves to impose its Controlled Shipping procedure on suppliers to implement and monitor redundant inspections related to observed quality issues. The Controlled Shipping procedure is detailed in section 5.4.5 of this manual.

5.4.4.4 Failure Confirmation

Supplier´s failure confirmation strategy shall follow the generic approach displayed below

I. Evaluate HARMAN´s complaint information related to key questions:
   - Has HARMAN´s description of the failure symptom been understood?
   - Is the occurrence mode of the failure known (sporadic, permanent, under specific application loads, under specific environmental conditions …)?
   - Is the instant of failure observation known (HARMAN incoming inspection, HARMAN production/test, OEM plant, field …)

II. Record “as received” part status, including
   - datecode/lotcode/serialnumber information
   - externally observable characteristics
   - part internal logfiles, data content of memory devices

III. Perform standard tests and inspections as specified in control plan
   - end-of-line tests
   - functional tests
   - dimensional and appearance inspection
   - out-of-box audit

IV. Perform failure oriented tests
   - tailored tests emulating application conditions at HARMAN
   - cyclic tests to reproduce sporadic failures

V. Perform tests under load
   - Tests coverage for tests under load shall be similar to that of the standard tests.

- Peripheral and environmental conditions during test shall be varied according to operational limits defined in part specifications, datasheets, drawings or similar documents.
- Load factors typically include temperature range and gradients, variation in supply voltage, vibration, humidity, physical loads
- Combinations and interactions of load factors have to be considered

If failure of the complaint part can be reproduced during standard tests (stage III) the failure oriented tests and tests under load may be skipped and the root cause analysis can be started (applies analogously to stage IV).

If the failure cannot be confirmed during stages III thru V the complaint part can be identified as “OK based on part analysis”.
HARMAN reserves to re-test parts deemed “OK based on part analysis” in the application environment to verify supplier´s Failure confirmation.
HARMAN reserves to request a joint analysis at HARMAN to expedite failure confirmation by supplier.
Supplier shall ensure that such joint analysis can be supported within 5 working days after HARMAN´s request.

5.4.4.5 Root Cause Analysis

Supplier shall use a systematic approach for root cause analysis based on findings during failure confirmation, review of production and test records, and physical analysis. Applicable methods include 5-Why-Methodology, Ishikawa-Diagrams, FTA and process mapping.
In general non-destructive analysis methods should be preferred over those that might destroy the failure condition.
Supplier shall identify all root causes that contributed to the issue observed, including

- Occurrence root cause(s), i.e. reason(s) that resulted in creation and propagation of a non-conforming characteristic or an inherent weakness of the product, as well as
- Escape root cause(s), i.e. reason(s) that resulted in non-detection of a non-conforming characteristic or an inherent weakness of the product before shipment.

5.4.4.6 Corrective Action

Supplier shall identify corrective actions for all identified occurrence and escape root causes and devise a plan and schedule for implementation.
All corrective actions shall be validated and effectivity shall be confirmed using applicable statistical methods.
Immediate containment actions have to be kept in place until effectivity of the corrective actions has been confirmed.
Supplier shall identify the first datecode/lotcode/serial number and shipment of parts including each corrective action and provide this information to HARMAN within discipline D6 of the 8D report.
Supplier shall evaluate whether the planned corrective action constitutes a supplier initiated change according section 5.5.2 of this manual. In that case supplier has to initiate the PCN process independently.
Implementation of those actions prior to PCN approval is subject to the deviation approval process as defined in section 5.4.10 of this manual.

5.4.4.7 Preventive Action

Supplier shall ensure that findings/knowledge gained while executing disciplines D2 thru D6 of the 8D process are extended across similar products and processes and will be considered in quality planning. This should include review of related FMEAs, standard operating procedures, design rules and similar documents as well as the consideration in the lessons learned process.
Supplier shall identify which parts or part families supplied to HARMAN are considered herein.

5.4.4.8 Supplier Problem Solving Performance

HARMAN measures effectivity of supplier´s problem solving process based on quality performance data and 8D reporting. Insufficient performance might result in escalation and – ultimately – blocking of suppliers for new business.

5.4.5 Controlled Shipping

5.4.5.1 General

In Controlled Shipping (CS) it is required by HARMAN that a supplier put in place a redundant inspection process to sort for a specific non-conformance, while implementing a root-cause problem solving process. This redundant inspection is in addition to normal controls and actions implemented via the HARMAN Q-Notification process and controls dictated by the Control Plan. Any additional cost associated with controlled shipping is the responsibility of the supplier. Any deviations to this requirement must be approved by HARMAN SQA.
HARMAN may require the use of a third party contractor (CS level 2) to conduct and manage the controlled shipping activity. A third party containment process is generally required when the supplier's own containment process, CS level 1, has proven to be ineffective. The third party contractor may be directed by HARMAN. If the third party contractor is selected by the supplier, HARMAN SQA maintains the right of approval for the supplier selected. HARMAN will require access to all CS level 2 data. Availability and formats are to be determined at the time CS level 2 begins.
The data obtained from the third party redundant inspection process as well as any additional audits are critical as both a means to measure the effectiveness of the secondary inspection process and also the corrective actions taken to eliminate the initial non-conformance. The Controlled Shipping inspection may be required to be performed outside the supplier's facilities at a facility deemed appropriate by HARMAN. CS level 2 may also be used to clean the material in pipeline and stock at both the supplier and HARMAN locations.
In cases where CS level 2 needs to be maintained over a long period of time because the containment and corrective actions are ineffective, and for this reason, supplier might be put on "no new business" and in worst cases on "active desource" at HARMAN.

5.4.5.2 Controlled Shipping Determination

HARMAN SQA makes the determination whether the supplier can effectively correct the nonconforming material situation through the HARMAN Q-Notification process and isolate HARMAN from the problem. One or several of the following issues may be considered for implementation of Controlled Shipping Level 1 or Level 2:

- Repeat, late or insufficient response to HARMAN Q Notifications, DMN's.
- Supplier's current controls are not sufficient to ensure conformance to requirements.
- Duration, quantity, and/or severity of the problem.
- Internal/External Supplier data.
- Major Disruptions and/or Downtime.
- Quality Problem in the field (i.e. Warranty).
- Controlled Shipping Level 1 failures.

5.4.5.3 Controlled Shipping Process

The following steps will take place when HARMAN places a supplier in Controlled Shipping:

- HARMAN will notify the supplier that Controlled Shipping is required. An explanation for the requirement and description of the process steps will be reviewed at this time. The required third party provider, if applicable, is also communicated.
- The supplier confirms requirements are understood and provides a plan of action to implement the Controlled Shipping process. Planned reporting mechanisms are also presented at this time by the supplier.
- HARMAN SQA reviews the plan and approves or rejects it. If the plan is rejected, HARMAN SQA provides feedback on adjustments required. Upon plan approval, HARMAN SQA provides exit criteria to supplier. The duration of Controlled Shipping will typically be 20 working days with zero defects at the CS inspection station following implementation of permanent corrective actions as described in HARMAN Q-Notification process.

Please refer to HARMAN Controlled Shipping Process procedure for further details including requirements, expectations, exit criteria etc.

5.4.6 Regular Reports from Supplier, Quality Improvement Plan

In cases where the product risk or production history warrants additional HARMAN attention, periodic quality reports will be requested from the supplier. Normally these reports will be requested on a monthly basis but they may be requested more frequently if the situation warrants. HARMAN will generally not mandate a format

for these reports but prefers, if available, to use a standard report format that the supplier uses internally. This allows HARMAN to better understand the types of metrics and reporting systems that the supplier normally uses.
However, it is expected that these reports will contain certain basic information related to the components produced for HARMAN and, in particular, the components which are causing the heightened level of attention. This basic information would include such items as:

- Quality Trends, (preferably in PPM), for HARMAN In-plant Failures, 0-KM Issues at End Customer, and End-Customer Field Return failures.
- Failure Pareto analyses
- Corrective Action Tracking in terms of Containment and Permanent Corrective Actions and Post Corrective Action performance.
- Response time metrics for Containment, Analysis and Permanent Corrective Actions, (how long to implement?)
- The duration of the reporting period will be agreed upon with the involved HARMAN Quality personnel.

Content and frequency of reporting will be agreed between HARMAN SQA/SQE and supplier.

In addition where supplier performance is deemed to require improvement, HARMAN may place the supplier on a Supplier Quality Improvement Plan (SQIP) in accordance with HARMAN procedure.

5.4.7 Supplier Quality Improvement Plan

SQIP is a HARMAN program used to improve the quality performance of the supply base by utilizing audits, data analysis, and by driving systemic changes in the manufacturing and quality systems on the shop floor. The program addresses systemic issues and is driven by supplier action plans and aggressive step down quality targets with consequences identified for failure to meet these targets.

SQIP will be introduced by Plant SQA/Regional SQA in the case of historically poor performing suppliers, and those that have negative impact on multiple Harman plants based on quality metrics (major disruptions, high PPM, high DMN), etc.

HARMAN Plant SQA/Regional SQA will summarize Quality metrics/ Expectation and Exit Criteria/Notification letter and communicate to selected supplier. Upon the agreement with supplier, HARMAN and supplier will publish step-down chart which defines quality target within given time frame. If supplier could not exit SQIP within time frame, HARMAN Internal supplier escalation will be set to determine to hold any new businesses.

During SQIP, Harman is expecting

- Leadership engagement, accountability, commits resources
- Participates in the process walk Audit (*when applicable*)
- Performs a detailed analysis of their manufacturing plant quality metrics, including Pareto analysis of the defect sources (manufacturing process or product line), the failure modes, the failure systemic root causes. These areas, along with the Harman Audits performed, should become the focus of the Supplier's Action Plans.
- The supplier is recommended to perform an effective analysis of root cause using quality tools like 3 Leg 5 Why Method and/or Cause-Effect Analysis or other similar quality tools.
- Develops a Manufacturing plant Quality Improvement Plan, which includes specific quality action plans and initiatives to address the issues identified in the Pareto analyses performed
- Develop sufficiency plans to address the quality gaps
- Develops a method to track implementation of the initiatives and resulting quality improvements Implements a lessons learned process across their Corporation using the Read across format or other similar tool(s)
- Conducts deep dives into FMEAs and Control Plans as necessary. These deep dives would require appropriate process, product, and material experts from the supplier.

5.4.8 Audits

HARMAN employs several audit tools to ensure suppliers meet appropriate quality levels. These tools are used at various stages throughout the supplier development process as well as in case of any problems during mass production. Audits may be conducted by external auditors or by HARMAN employees. Audit types include the following:

1. A supplier Assessment (Process/Technical Evaluation-PE/TE or VDA6.3) : HARMAN conducts PE/TE or VDA 6.3 assessment of supplier by means of supplier approval and supplier re-qualification process. Supplier assessment is target to determine suitability of supplier's technical capability and suitability of a supplier's manufacturing process. A supplier assessment will be conducted for potential new suppliers, existing suppliers (who have plans for new transfer site, new technology or other changes) or for re-qualification by HARMAN supplier quality engineer if required.
2. Mass Production Approval (MPA): HARMAN conducted evaluation to approve a supplier's manufacturing line for a sourced product. The MPA includes a review of run@rate and manufacturing related paperwork as well as a "process walk" through the entire manufacturing process which builds the HARMAN product. This "process walk" will typically begin in receiving/inspection, proceed through the entire manufacturing process, and end in packaging/shipping. The MPA includes "run at rate" calculations to ensure suitable manufacturing capacity.
3. Process Walk: HARMAN conducted evaluation of a specific manufacturing line which produces a HARMAN product. The process walk is used to evaluate current manufacturing capability or investigate supplier manufacturing issues.

Audits are as follows:

Evaluation Title	Typically When Used		Type of Scoring	Brief Description
1) Process/Technical Evaluation (PE/TE or VDA 6.3)	Prior to Sourcing, Potential analysis, New production site, New technology , Problem Audit, Re-qualification audit		0 – 100%	Assess manufacturing/technical capability
2) Mass Production Approval (MPA)	Prior to Start-of-Production (SOP) for specific part/project		Green, Yellow, Red	Approval for mass production
3) Process Walk	Following Start-of-Production, Problem Audit		0 – 100% or Green, Yellow, Red	Investigate manufacturing issues or review manufacturing line

The supplier will make available appropriate management personnel as well as technical personnel for each phase of the above audits. Supplier shall perform self-assessment at least 1 week before HARMAN audit and supplier's self-assessment will be baseline documents for HARMAN onsite audit. Complete access must be granted to all phases of the manufacturing process, to include clean rooms, laboratories, storage areas, etc. The audit team will be limited in sensitive areas; however, the supplier must accommodate at least two auditors in all areas. Appropriate protective equipment/clothing will be provided to HARMAN personnel for access to these areas. (Where special protective gear or clothing is required, it will be the supplier's responsibility to insure that this is available in sizes appropriate to the inspection team members.)
Suppliers can best prepare for these audits by conducting an internal review/audit using the HARMAN evaluation/assessment documents. These documents are available through the Supplier Quality Engineering Department.
In general HARMAN expects an action plan to address each non-conformance of the audits within two weeks, to include completion dates agreed upon by HARMAN personnel.

5.4.9 Repair or Rework

5.4.9.1 Authorization for Repair and Rework

Under normal production circumstances, only Repair or Rework which has been approved in the process documentation and embodied in the sample or approval parts supplied to HARMAN is authorized.
Supplier shall request deviation approval for any other repair or rework that is needed to avoid supply shortage.
Any unauthorized repair or rework process is prohibited.

5.4.9.2 General requirements for Repair and Rework

Where rework or repair is necessary, the supplier must develop written procedures for the rework/repair operation. These procedures must provide for relevant monitoring, inspection, and testing steps after rework, in order to ensure conformance to all applicable requirements. Reworked product shall be re-tested and audited through the standard production monitoring system. This applies to both individual parts and assemblies.

Repair/Rework General Requirements:

1) Repair/Rework area:
   a) A dedicated repair/rework area for the product shall be established.
   b) Tools suitable for the repair/rework shall be readily available.
2) Training and qualifications:
   a) Only trained and qualified personnel shall conduct repair/rework on HARMAN products. Training records must be available for review upon request by HARMAN.

3) Traceability:
   a) Traceability shall be established with appropriate labelling/identification to ensure that products subjected to repair/rework can later be identified to aid in potential future problem solving. In addition, traceability of components used shall be maintained at the same or higher level as that used for production.
4) Inspection and Testing:
   a) Suppliers must submit a “Control Plan” for repair/rework process” that identifies relevant monitoring, inspection, and testing steps after rework, in order to ensure conformance to all applicable requirements.

5.4.10 Deviation approvals

Suppliers are expected to strictly adhere to the production process and materials documented within the PPAP. When a deviation from the process or materials is needed, or the characteristics of the supplied product are out of specification, the supplier must obtain written approval from HARMAN prior to shipment. The request for deviation must be delivered providing sufficient time for evaluation and validation of the change / non-conformity. The request must contain explicit details of the change / non-conformity including:

1. Header information
   a. Part number
   b. Part description
   c. Where used report
   d. Manufacturing location
   e. Dates of manufacture
   f. Contact information
2. Description of the change / Non-conformity
3. Complete list of parametric differences resulting from the change
4. Reason for the change / non-conformity
5. Proposed Control Plan and PFMEA
6. Validation results
7. Schedules
8. Method of change / non-conformity identification (package labels, date codes, etc.)
9. Expected duration (Time and Quantity)
10. Plan for returning to normal production of conforming goods.

Deviation approval is considered as a temporary change request, therefore the supplier shall inform HARMAN procurement. After HARMAN has determined the change / non-conformity is acceptable, written approval will

be granted. This approval process may be lengthy as it may require notification or approval from HARMAN's customer.

5.4.11 Traceability

5.4.11.1 Introduction

All suppliers to HARMAN shall have an effective lot definition and traceability procedure. Delivered product must be traceable back to Supplier process, operation equipment, quality and process inspection/test data and the raw material. The definition of lot shall be set up based on supplier's risk assessment which influencing the process and sub-component/material. Suppliers shall ensure that their lot traceability system maintains its integrity throughout all influencing process and entire extended supply chain, including not only raw material, but also purchased components/products.

5.4.11.2 Traceability Requirements

1. All traceability documentation must proceed through a database and the data must be available for analysis within 24 hours.
2. Supplier shall maintain a product change history to keep a history of all changes to the product delivered to HARMAN

5.4.12 Resident Engineer

Under certain circumstances, HARMAN will request the supplier to provide on-site engineering services. Arrangements for resident engineering will typically be made during the APQP stage of product development; however, HARMAN reserves the right to request supplier resident engineering support in response to quality-related events that occur during series production. It is expected that the supplier will provide an appropriate expert for the required position. The resident engineer shall be equipped, at the supplier's expense, with tools necessary to carry out his duties.
While on HARMAN properties, the supplier resident engineer is expected to be aware of and follow all HARMAN codes of conduct and ethics as well as all laws applicable to the location. Failure to do so will result in the discharge of the resident engineer at which time the supplier will be expected to provide a suitable replacement.

5.5 Quality assurance for changes

5.5.1 Changes initiated by HARMAN

Changes initiated by HARMAN shall be performed in accordance with the normal HARMAN practices. This will typically include detailed Design interaction as well as Procurement/ Purchasing activities to handle updating quotes and / or contracts, where necessary. Validation program requirements or PPAP requirements will be negotiated with the HARMAN SQE organization, with input from Design Engineering, Program Management, or the Purchasing/Procurement organizations as required. Supplier shall ensure that changes are implemented ~~to~~ according to the schedule that was aligned with HARMAN.

5.5.2 Changes initiated from the supplier

In the case of changes initiated by the supplier, which will include changes to the manufacturing materials, processes, or locations as well as any design changes, the Supplier shall submit a Product Change Notification (PCN) to their HARMAN Procurement contact and email to PCN_supplier_in-box@harman.com. It is required that the supplier notifies HARMAN as far in advance as possible to give HARMAN the opportunity to examine the consequences and, if required, to introduce suitable measures.
Implementation of such change is only permitted after approval by HARMAN. Supplier shall ensure supply of HARMAN approved product until PCN becomes effective and related PPAP is approved.

The PCN shall contain following information

- Product Identification (e.g. supplier part number, affected product lines incl. specific package types, product family),
- Detailed description of change(s),
- PCN tracking number,
- Reasons for changes(s) (e.g. commercial, quality, capacity),
- Name, address, telephone, email of supplier contact,
- Implementation date for change,
- Anticipated impact on form, fit, function, or reliability,
- Supplier Qualification plan results, where applicable,
- Customer parts number(s),
- Date, if required, when qualification samples are available,
- Date, if required, when final qualification data are available,
- Last date, if applicable, of manufacture of the unchanged product.

In addition to the above information, HARMAN requires to know the following:

- Scheduled start of mass production,
- Scheduled delivery date to HARMAN,
- Availability of PPAP documents,
- Whether this change was already implemented at any other product supplied to HARMAN,
- Whether this change was already approved by any other automotive customer
- Risk evaluation by the supplier.

Where appropriate, the supplier may be asked to provide samples for HARMAN qualification. HARMAN Qualification requirements and PPAP requirements will be aligned with the HARMAN Supplier Quality engineering, with input from Design Engineering, Program Management, Test Qualification or the Purchasing/Procurement organizations as required.

5.5.2.1 Additional PCN requirements for Active, passive components, including LEDs

To meet our OEM directions, the supplier shall always add the ZVEI/DQM ID and the Type of Change (description), when providing a new PCN to HARMAN. Supplier shall always list all changes, not only the major change triggering the PCN and re-send the shrinked DQM Matrix.xls accordingly.

For details please follow the link to the ZVEI:
http://www.zvei.org

5.5.3 Product Discontinuation

If a product is to be discontinued, the supplier must inform HARMAN of such in writing as early as possible (at least 12 months before production stop). This notification must be delivered in the form of a Product Termination Notice (PTN) to the HARMAN Procurement / Purchasing who is currently responsible for this component. The supplier shall provide information such as last time buy schedule.
The supplier shall provide failure analysis support for discontinued parts to HARMAN.

5.6 Sub-Supplier Management

The suppliers are responsible for managing the quality of the sub-suppliers.

Since HARMAN's products are used in automotive applications, the supplier shall hold their suppliers to automotive quality levels and systems. The requirements provided by Harman shall be cascaded to supplier's supply chain as appropriate. These terms applies to distributers as well.

5.7 EMS (Electronics Manufacturing Service) Supplier Requirements

5.7.1 General definition

To define the manufacturing systems, guidelines and requirements for HARMAN designed electronic module, electronic assembly, and printed circuit board assembly (PCBA) suppliers to HARMAN OEM Business will adhere to the following guidelines.

- 2042711 Manufacturing guideline for HARMAN EMS supplier

6 Supplier Evaluation

HARMAN will make frequent supplier evaluations. The target of the supplier evaluations is to identify and report good and bad supplier performances and also to make opportunities for improvements visible and transparent. The results of these evaluations will be reported internally at HARMAN and also to the supplier. At HARMAN these results will be taken into account in the sourcing process and awarding of new business. At the supplier it is expected that measures will be defined that lead to continuous improvements of these evaluation results.

7 Requalification of product and process at suppliers

To ensure conformity to all specified requirements the Supplier must carry out a regular requalification for the supplied components.

All parts being delivered to HARMAN shall be subjected to a regular and planned requalification. Therefore a layout inspection (complete measurement of all product dimensions shown on the design records), a functional verification to applicable requirements and verification of reliability features and parameters shall be performed as specified in the control plans.
Their manufacturing processes shall be subjected to a regular and planned requalification as well.
Scope and frequency shall be planned by the supplier and be specified in the Control Plan. Complexity and criticality shall be taken into consideration. It shall be agreed with the assigned SQE at HARMAN. Higher frequencies may be implemented in case of target deviations (e.g. exceeding ppm action limits) with impact on the end customer.
A formation of part families for requalification planning and execution is permissible.
Requalification planning shall be done during APQP already. Plan shall be provided within PPAP documents.

The results of the requalification shall be documented. The results shall be submitted on demand to the responsible SQE at HARMAN.

In addition to this requalification, additional or specific periodic validation may be required by HARMAN, HARMAN customers or for regulatory compliance purposes. In these cases, supplier shall comply with these requirements, as appropriate. HARMAN and HARMAN customer´s requirements will be provided to the suppliers specifically. Requirements that are related to regulatory compliance issues need to be determined by the suppliers themselves.

8 Disaster Recovery and Business Continuity Plan

Suppliers shall implement a Risk Management and Disaster Recovery Plan for potential catastrophes or work interruptions that would interrupt the supply of their product to HARMAN. This Disaster Recovery Plan shall comply with ISO/TS 16949 requirement 6.3.2 and include at a minimum contingency plans to address interruptions due to material supply, transportation, computer, personnel or sub-supplier issues.
The Recovery Plan should take a proactive approach including a plan of action, checklist of activities, communication plans, escalation procedures, and organization with teams, roles, and responsibilities. A Disaster Recovery Plan must be in place for all manufacturing sites and operations involved in producing and shipping product to HARMAN. Supplier must immediately notify HARMAN of the course of action during any period of actual interruption as well as the chain of command contacts.

9 Document and product sample retention

Documents, records, data and reference- or master-samples that are elements of the PPAP submission, must be maintained for the length of at least one year after the discontinuation of the delivery of the product to HARMAN for mass production and service part demands.
Records of the mass production phase of the delivered product e.g. test charts, control cards, measurement reports have to be maintained for the length of at least one year after the delivery of the product, to which the records belong to.
Quality records for critical characteristics shall be retained for the length of at least 15 years after the discontinuation of delivery of the product.
Quality requirement documents and quality records must be maintained for the length of at least 15 years after the discontinuation of the delivery of the product to HARMAN for series and spare part demands.

10 Training

Should quality assurance problems arise with fulfilling the requirement from this SQM or other Quality-standards, HARMAN may support the supplier with regard to training or by referring him to possible training courses. HARMAN may also initiate training sessions for the supplier if he is unable to fulfil the requirements from this SQM.