



Hyundai Motor Manufacturing Alabama

HYUNDAI MOTOR MANUFACTURING ALABAMA, LLC

Supplier Quality Manual



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Section 1: Introduction / Purpose

- This Supplier Quality Manual is intended for those suppliers who directly supply parts / components to Hyundai Motor Manufacturing Alabama, LLC (HMMA) and sets forth the quality, purchasing, and logistic requirements under which the supplier will provide prototype, production and service material. This manual enhances / provides clarification, but does not replace any other automotive standards.
- In support of HMMA commitment to excel as a world-class operating OEM, suppliers are expected to commit to excellence by operating with the intent of exceeding HMMA's expectations.
- As HMMA continues its quality leadership in being a world-class OEM leader, a total commitment with the principles of continuous improvement and zero defects is needed from our suppliers of purchased parts and components.
- Supplier visits are encouraged at HMMA. As suppliers are viewed as HMMA partners, suppliers may provide valuable solutions to concerns/issues that may exist.

Section 2: Content Structure of HMMA Supplier Quality Manual

This publication should serve as a guideline for an effective customer-supplier relationship to enhance the communication needed to continue the path of operating as a world-class OEM.

As an accredited TS16949 OEM, the chapter numbering system of this manual mimics the numbering system found in the current TS16949 Technical Specification booklet. Therefore, some numbers or sections may appear to be left out.

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Section 3: Terms and Definitions

4M -	Machine, Man, Material, Method
5S -	Sort, Straighten, Shine, Standardize, Sustain
AQL -	Acceptable Quality Level
APQP -	Advanced Product Quality Planning (PSO)
ASN -	Advanced Shipping Notification
EO -	Engineering Order
FPSC -	First Production Shipment Certification
ISIR -	Initial Sample Inspection Report
MD -	Management Deviation
OEM -	Original Equipment Manufacturer
PC -	HMMA Production Control
PD -	HMMA Part Development
PO -	Purchase Order
PQ -	HMMA Part Quality
PPM -	Parts per Million (defects)
PSO -	Process Sign Off
QA -	Quality Assurance
QC -	Quality Control
QIR -	Quality Information Report (from warranty, QA)
Q2 -	Quality defect notice to supplier – delivered via the supplier portal
Q3 -	Quality scrap count (used for PPM calculation)
Q4 -	Quality rework count (used for PPM calculation)
SAP -	Supplier Access Portal
SOP -	Start of Production
SQD -	Supplier Quality Development (subgroup within in Part Development)
SPA -	Supplier Process Audit (sometimes referred as VPA, Vendor Process Audit)
Supplier -	Providers of parts / components directly to HMMA.

Section 4: Quality Management System

4.1 – General Requirements

The facility shall be registered to the quality management system applicable to their facilities providing components for HMMA.

4.2 – Documentation Requirements

Quality Manual – The supplier shall contain a manual that conforms to the TS/ISO 16949 requirements.

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4.2.4 – Control of Records

All part approval records, purchasing record orders, and tooling record orders shall be maintained by the supplier for the duration of the component production lifetime and plus one year thereafter.

Production inspection records (i.e. control plan checks, Inspection Agreement results) shall be maintained in a legible format for the duration of one year after creation.

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Section 5: Management Responsibility

5.4.1.1 – Quality objectives

The supplier shall define the quality objectives needed to address and achieve customer expectations within a specified time period.

5.5.2.1 – Supplier representative / contact information

The supplier shall ensure that a contact list is provided for their facilities.

- Normal contact – a name or names with contact information shall be provided for routine contact during regular HMMA production hours. HMMA manufactures vehicles on three shifts.
- 24 hour contact – this list should also provide the cell phone #'s that can be contacted if also needed during non-production hours should extraordinary situations or circumstances develop.

The supplier is responsible for ensuring that the contact list is updated when any organization changes are made. Lacking any changes, the supplier is responsible to review the contact information to ensure it is current at a minimum of every six months.

5.6 – Management Review

The supplier is responsible for holding regularly scheduled reviews of their internal management systems to ensure that the goals and objectives of HMMA are being met. The reviews should capture goals from design, manufacturing, logistics, customer satisfaction, sub-supplier performance, and new business development.

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Section 6: Resource Management

6.2.2 – Training

The supplier shall have documented procedures for the training of its employees from instructors that are well versed in the area being taught. An emphasis should be placed upon customer focus.

6.3.1 – Plant, Facility and Equipment Planning

Plant layouts should employ Lean Management principles to optimize operational efficiency. Additional information on Lean and Value Stream Mapping can be obtained from www.lean.org.

6.3.2 – Contingency Plans

The supplier shall prepare contingency plans to satisfy HMMA requirements in the event of an emergency such as force majeure, utility interruptions, labor shortages, key equipment failure, and field returns. Once the supplier is aware of a possible interruption to HMMA production, the supplier shall contact Production Control and Parts Development at a minimum of 24 hours in advance, if possible. The supplier shall communicate the nature of the problem as well as present the recovery plan to ensure sufficient supply of product. Production interruptions may include, but not limited to, natural disasters, political unrest, quality problems, capacity issues or other events which prevent the supplier from ensuring on time shipment to HMMA or an HMMA warehouse / sequence operations facility. This notification would include any issues that could impact product launch timing.

6.4.2 – Cleanliness of Premises

HMMA strongly encourages the use of Lean Management principles to support the overall goal of process efficiency and effectiveness within the supplier's organization. Progress toward this goal should be an input to the supplier's Management Review.

5S - The supplier shall implement and maintain a 5S program for its premises for the purpose of maintaining a state of order, cleanliness, and repair consistent with the product and manufacturing process needs. Suppliers are encouraged to have an incentive(s) for the employees to participate in the 5S system.

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Section 7: Product Realization

7.1 – Planning of Product Realization

If requested, the supplier's Advanced Product Development process shall be in accordance with HMMA's Process Sign-Off (PSO) Forms (Document # HR-AL-PQ-PD-F-00010), and Initial Sample Inspection Report (ISIR) Checksheet (Document # HR-AL-PQ-ALL-F-057).

If requested from HMMA, suppliers are to complete an Advanced New Part Quality Plan timing chart as found in the PSO forms. (Unless directed by HMMA, engine suppliers will not submit PSO activities due to the advanced activities and direct communications that occur between the engine suppliers and HMC R&D. The development of engine suppliers commences much in advance before the final drawing is released).

If requested, the PSO activities should be updated and submitted to HMMA on a regularly timed basis as set forth by the HMMA Part Development group. In the event a supplier falls behind the planned schedule, it is the responsibility of the supplier to notify HMMA immediately and provide a detailed recovery plan to return to the agreed schedule. All recovery plans must be approved by HMMA prior to implementation.

Documentation to be Developed and Maintained (Please note that other documentation may be required):

- Maintain updated timing charts
- Maintain updated Open Issues list / Meeting Minutes
- Maintain Process Flow, Control Plan and Reaction Plan
- Complete the PSO Forms
- Complete Reliability (validation) tests
- Complete ISIR
- Perform and pass SPA
- Perform and pass the FPSC (prior to producing and shipping the first shipment of production level parts)

PSO

Content of the PSO shall consist of the following items:

- Advanced New Part Quality Plan
- Quality Target
- Preventative Check for Old/Current Problems
- CAPA Plan
- SQ Certification Vendor Control Plan
- Prototype Control Plan
- Prototype Part Inspection Report
- Prototype Improvement Plan
- Initial Spec vs Changed Spec
- Part Durability Test Plan

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- Production Preparation Schedule
- Production Process Control Plan
- P1-Previous Model Problem Check
- Sub-supplier Part Order Status
- Packaging
- Durability Test Result
- CAPA Result
- SQ Certification Vendor Operation Check
- Sub-supplier Part Check
- Process Audit
- ISIR
- FPSC

Upon completion of the PSO forms, the information shall be submitted to HMMA Part Development.

7.1.3 – Confidentiality

Suppliers shall ensure confidentiality of HMMA specific products and projects under development, and related product information. No information shall be communicated to any external parties without the written approval of HMMA.

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7.1.4 – Change Control

HMMA Initiated Changes

- EO# -- Many changes implemented at HMMA are driven with an Engineering Order # when the designed component has undergone a cosmetic or dimensional shift from the submitted ISIR print. The supplier shall submit an ISIR warrant and any supporting data as deemed appropriate from the Part Quality group. (Reference the ISIR checksheet, Document # HR-AL-PQ-ALL-F-057, to determine which level of ISIR is to be submitted). The submission will be made to Part Development.
- Non EO# change – some changes may not require an EO# for the change. Such an example could be shifting a dimensional location, already within specification, closer towards the nominal value. The supplier's 4M procedure will indicate whether HMMA should be contacted.

Supplier Initiated Changes

The supplier shall have an internal 4M procedure in place to handle changes. (4M = Machine, Man, Material, Method). The supplier will make the determination based upon their 4M procedure on whether HMMA should be contacted for the 4M change. (i.e. Communication with HMMA may not be necessary of minor process improvements that do not affect the end



visual, dimensional, and functional characteristics of the current HMMA approved product that is being utilized. Suppliers are encouraged to contact HMMA PQ / SQD if uncertain).

For changes made from sub-suppliers to HMMA (i.e - tier 2, tier 3, etc), the tier 1 supplier to HMMA will control the submission process from their respective suppliers, and then submit an ISIR warrant or 4M warrant (if determined necessary by the tier 1) to HMMA Part Development. This is the expectation apart from directed tier 2 suppliers for which HMMA has direct involvement for approvals.

For 4M submissions, suppliers are to reference the ISIR checksheet (Document # HR-AL-PQ-ALL-F-057) to determine which level of ISIR is to be submitted.

7.2.1 - Pricing / Payment

Suppliers shall remain globally competitive and are expected to work with HMMA Part Development buyers towards implementing cost saving / VAVE ideas. The suppliers are also expected to have an internal cost reduction system to manage their costs.

Pricing shall be in accordance to the contents found under section three of the Request for Quote (Document # HR-AL-PG-PD-F-06061).

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Payment shall be in accordance to the contents found in the HMMA Parts Development Terms and Conditions (Document # HR-AL-LG-F-00008).

Information from this section can be obtained from the buyer of Part Development.

7.2.1.1 - Customer-designated special characteristics

See section 7.3.2.3

7.2.2.2 - MSDS

Suppliers of raw materials must submit MSDS information to the HMMA Safety/Environmental group.

7.3 – Design and Development

7.3.1.1 – Multidisciplinary approach

The supplier shall use a multidisciplinary approach to prepare for product realization including the development of special characteristics (development, finalization, and the monitoring of),



and development and review of FMEA's (including actions to reduce potential risk), and the development of control plans.

7.3.2.2 – Manufacturing process design equipment

Suppliers' shall review details of the equipment needed to manufacture products to HMMA requirements, the costs involved to utilize equipment needed to sustain robust quality levels while sustaining HMMA production capacity, and also reviewing best practices from past programs to ensure that the proper poka-yoke systems are in place commensurate to the risks encountered.

7.3.2.3 – Special characteristics

On the control plan, the supplier shall ensure that HMMA designated special characteristics are identified and are being monitored by inclusion on the control plan and all associated product and processing documentation including but not limited to process diagrams, FMEA's, work instructions, visual aids, etc. If HMMA does not specify special characteristics, the supplier shall specify the appropriate internal special characteristics for the purpose of monitoring product and process control to assure conforming product shipped to HMMA. The Part Quality Specialist can provide assistance.

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Statistical Process Control (SPC) techniques shall be used to monitor the special characteristics as they are process driven. The SPC measurements must demonstrate the component's process stability and process capability at a minimum value of 1.67.

Note: This is a very important review during the Supplier Process Audit (Document # HR-AL-PQ-ALL-P-003) and the 5-Star evaluation (Document # HR-AL-PG-SQD-P-00004).

7.3.5 – Design and Development Verification

The supplier shall perform design verifications to ensure conformance to HMMA requirements. The supplier may likely work closely with the HMC design group in Korea, along with the HATCI design teams located at HMMA and in Michigan.

7.3.6.2 - Prototype Program

The supplier shall have a comprehensive prototype program which includes FMEA's Control Plans and associated documentation necessary to produce and deliver parts for P1 and P2 prototype phases to HMMA. The supplier is responsible for the quality of all parts delivered to HMMA.



7.3.6.3 – Production Approval Process (ISIR)

Initial Sample Inspection Report – ISIR

The supplier shall comply with the content presented in the ISIR checksheet (Document # HR-AL-PQ-ALL-F-057).

The supplier will submit Initial Sample Inspection Report (ISIR) documentation containing all the required information as specified from their respective HMMA Part Quality Specialist. The contents of the ISIR will be reviewed to ensure all requirements have been successfully completed. Formal approval of the ISIR is a mandatory requirement for each supplier of parts. Contact your assigned Part Quality Specialist for additional details if necessary.

For production parts, the supplier shall perform process capability studies on any special characteristics (see section 7.3.2.3) deemed critical from HMMA. The process capability study must contain a minimum quantity of thirty parts per mold, cavity, etc. Unless otherwise specified from Parts Quality, the process capability number (Ppk) must be 1.67 at a minimum.

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First Production Shipment Certification (FPSC)

Upon approval of the ISIR, the supplier will perform a **run-at-rate**, FPSC (Document # HR-AL-PG-SQD-S-00002), to ensure that expected capacity volumes can be successfully met. A Supplier Quality Development member may attend this event at the supplier's manufacturing location.

7.4 – Purchasing

7.4.1.1 – Regulatory Conformity

See section 7.2.2.2



7.4.1.2 – Supplier quality management system development

HMMA requires that all tier one suppliers of parts, components and materials that manufacture and ship to HMMA must be:

- Registered to ISO/TS16949:2009 by an accredited third party registrar.
 - Exceptions to this will be:
 - for new suppliers producing product within newly started manufacturing sites and requiring at least twelve months of manufacturing data to satisfy the foundational guidelines of TS16949. Accreditation is to be achieved within the first 36 months of operation.
- Tier one distributors of parts, components or materials must be registered to ISO 9001:2009 by an accredited third party registrar.
 - Exceptions to this will be:
 - For Tier 1 KD parts, the originating manufacturing facility must be TS16949:2009 certified. The North American pass-through locations for these parts are exempt from ISO9001:2009 certification provided PPM and delivery requirements are within HMMA's acceptable criteria - PPM < 7 and Delivery Downtime < 5 minutes."

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Suppliers shall forward copies of their current certifications to HMMA Part Development.

Should a supplier's accreditation be placed on hold, the supplier shall notify HMMA Part Development within five business days of the hold notice.

Suppliers of non-automotive product should contact their buyer for specific requirements.

7.4.3.2 – Supplier Monitoring

Supplier Scorecard - HMMA shall utilize a Supplier Scorecard (Document # AL-PG-SQD-P-00003) for evaluating a supplier's performance. The quarterly scorecard will be based upon the following three categories.

- Part Quality (PPM, Downtime, and Responsiveness)
- Production Control (ASN Errors, Delivery Downtime)
- SQD Warranty (QIR Responsiveness)



DEFINITIONS

Unless noted differently in section “OUTPUT” of the documented procedure, the supplier scorecard will be comprised of the following grades:

- Green (G) – signifies that the supplier is performing at the “Acceptable” level for HMMA.
- Yellow (Y) - signifies that the supplier is performing at the “Marginal” level for HMMA.
- Red (R) - signifies that the supplier is performing at the “Unacceptable” level for HMMA.

Suppliers receiving a Red score for a given month may be requested to submit corrective actions to the respective HMMA group, and also possibly to the HMMA executive staff.

For a more detailed description scorecard, refer to the Supplier Scorecard Procedure (Document # HR-AL-PG-SQD-P-00003).

Premium Freight

Incidents of premium freight deliveries shall be monitored by the supplier and reported to HMMA Production Control.

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Refer to the HMMA Production Control Manual (Document # HR-AL-PC-S-02) for more details.

5-Star Audit (Document # HR-AL-PG-SQD-P-00004)

HMMA also utilizes the 5-Star evaluation as a supplier monitoring tool. This evaluation, specific to Hyundai / Kia, is used to review the quality management aspect and performance of suppliers.

The 5-Star evaluation is an integral part of the evaluation process as suppliers’ future award of business may be determined upon the results of the evaluation.

The 6 Sections of the 5-Star Audit are:

- Control of New Development
- Quality Objectives and Work Environment
- Control of Production Processes
- Inspection and Testing
- Corrective and Preventative Actions
- Control of Purchased Product



7.5.1.1 – FMEA's and Control Plans

- FMEA's – suppliers can use the PFMEA form (Document # HR-AL-PQ-ALL-F-012) found in the ISIR checklists or can utilize their company-specific template as long as the template is TS-compliant. Suppliers shall prepare process FMEA's (PFMEA) for all part numbered products that are directly shipped to HMMA.

The supplier shall have action plans in place to continually reduce the top 10% of all Risk Priority Numbers (RPN's).

- Control Plan – suppliers shall use a TS16949 content Control Plan. The supplier shall provide control plans for prototype, pre-launch, and volume production levels. The Control Plan should be the evaluation measurement criteria of ensuring or detecting compliance of proposed process failure modes captured in the PFMEA.

A direct relationship shall exist between the process documentation (i.e. PFMEA, control plan, and work instructions/standard). Suppliers shall maintain these documents to ensure they represent current approved operations.

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7.5.1.2 – Work instructions

Operators shall utilize the most recent work instructions (standard) applicable to their respective work stations that have an impact on product quality. The instructions shall be accessible for use at the work station.

7.5.1.3 – Verification of job set-ups

Setup instructions of the jobs will be performed and records will be maintained. Error proofing audits shall be completed once per shift. This action should be performed at the beginning of each shift. Compliance sheets shall be maintained for verification of the audits performed.

7.5.1.4 – Preventive and Predictive Maintenance

The supplier shall have an established and documented system for addressing preventative maintenance. Techniques for improvements in equipment efficiency and effectiveness should be utilized.



7.5.1.6 – Production Scheduling

HMMA suppliers will receive electronic production scheduling and will be expected to have send ASN's at time of shipment. Any ASN errors from the supplier will be captured in the supplier scorecard. (See section 7.4.3.2)

Suppliers should also reference the HMMA Production Control manual (Document # HR-AL-PC-S-02).

7.5.3 – Identification and Traceability

Follow guidelines provided in the HMMA Production Control Manual (Document # HR-AL-PC-S-02).

7.5.4 – HMMA ownership

Returnable containers and other tooling ownership of HMMA shall be in agreement with the Terms and Conditions (Document # HR-AL-LG-F-00008).

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7.5.5 – Preservation of Product

Packaging

Suppliers shall provide packaging in accordance to the HMMA Production Control Manual (Document # HR-AL-PC-S-02). A copy of this manual can be provided from the Production Control specialist.

7.5.5.1 – Storage and Inventory

Suppliers shall utilize a FIFO (first-in-first-out) system to minimize product deterioration and inventory obsolescence.

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Section 8: Measurement, analysis and improvement

8.1.1 - Identification of Statistical Tools

Reference the latest manuals of AIAG SPC for utilizing proper manufacturing process tools and AIAG MSA for details on measurement system management.

8.2.1 – Customer Satisfaction

See section 5.6.



8.2.2 - Internal Audit

Qualified internal auditors should be in place to assess quality management related processes on annual schedule. Management should ensure that actions are taken to quickly remedy any findings and observations which require corrective action.

8.3 – Control of Nonconforming Product

The supplier shall have processes and systems (containment procedure) in place to prevent the shipping of non-conforming material intended for HMMA production.

Containment

Should the supplier need to contain product within HMMA, the supplier shall contact HMMA Part Quality for the proper guidance and instructions before commencing with any containment. Suppliers should seek every opportunity to contain any non-conforming product before arrival to HMMA.

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Production Downtime

Should the production line become interrupted due to a supplier related quality issue (i.e. component defect, delivery issue), the supplier will be financially charged for any production downtime in which they are duly responsible. As downtime will also be captured in the supplier scorecard, the supplier should ensure that the downtime attributed to their facility is accurate. Suppliers usually have 10 days to refute a downtime once notified from HMMA.

8.3.4 – Customer waiver (Management Deviation)

Management Deviation (Document # HR-AL-QC-F-0001)

PMR (Document # HR-AL-LI-BODY-F-00065)

When the supplier requires a deviation permit to ship product that does not conform to the ISIR approval (i.e. different process, different component, product does not meet dimensional print, product does not meet validation results), the supplier must obtain an HMMA signed Management Deviation (MD) or a signed HMMA PMR which describes the detail of the deviation. The supplier shall not ship non-conforming product without either of these signed forms.

If an MD is authorized, the supplier shall maintain a record of the expiration date of the MD or the quantity authorized by the MD. The supplier shall ensure compliance with the original or superseding specifications and requirements when the authorization expires.



8.5.2 – Corrective Action

Should non-conforming product arrive to HMMA, suppliers may receive a formal non-compliance notification in the form of a Q2 from the supplier portal system. Non-conformances can be created for any product quality, service and/or delivery issues.

Within the Q2 system, the supplier must respond with a plan for containment of all suspect material at the HMMA facility, in-transit, and at their manufacturing location. Containment shall be in place within 24 hours of notification. The timely response to containment supplemented with the effectiveness of the corrective action response is captured in 'Responsiveness' section of the supplier scorecard. (See section 7.4.3.2)

Suppliers shall complete the corrective action report as deemed appropriate from the HMMA Part Quality team.

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Based on the severity of the issue:

- The supplier may be requested to present the corrective action plan at HMMA. During this visit, the supplier may be asked to present the information in the format of the "5 Panel Countermeasure Report" (Document # HR-AL-MT-F-32).
- Verification of the corrective actions and countermeasures implemented by the supplier may be performed by HMMA quality personnel at the supplier location to ensure effectiveness. Emphasis will be placed on error proofing techniques to avoid recurrences.

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Revision Record

<u>Date</u>	<u>Revision</u>	<u>Description of Change</u>
13-October-2007	0	Initial Revision
16-October-2007	01	Change document type to allow creation of manual in PDF format (document control).
16-October-2007	02	Minor editing corrections.
16-October-2007	03	Section 7.4.1.2 – Specify tier 1 suppliers.
26-October-2007	04	Section 7.4.3.2 – Addition of premium freight.
20-February-2008	05	<ul style="list-style-type: none"> a) Section 7.4.3.2 – Addition of QIR responsiveness (warranty metric) to supplier scorecard. b) Various sections - Production Control Manual document # correction c) 7.1.4 – Edits to Change Control d) 8.3.4 – Edits to Customer waiver
29-January-2009	06	Section 7.3.6.3 – removed ISIR table; minor edits. Section 7.4.3.2 – score ranges modified to match the scorecard.
07-Septebmer-2009	07	Section 7.4.1.2 – ISO14001 date extension.
12-November-2009	08	Section 7.1 – PSO updates. Section 7.3.6.3 – FPSC – SQD may attend event.
22-March-2010	09	Section 7.1.4 – wording of change control (4M). Section 7.4.1.2 – TS and ISO date changes.
28-January-2011	10	Section 7.4.1.2 – ISO14001 date extension.
31-March-2011	11	Minor editing corrections. Section 7.4.3.2 – revised PPM scale
4-February-2013	12	Section 7.4.1.2 – minor editing corrections. Section 7.4.3.2 – revised PPM scale
8-February-2013	13	Section 7.4.3.2 – minor editing corrections
20-February-2013	14	Minor editing corrections to footer and pagination
8-February-2013	15	Update revision record
25-June-2013	16	Section 7.1 – PSO updates Section 7.4.1.2 – Quality requirements Additional editing corrections

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