

Global Supplier Quality Manual - TRW Automotive

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[Revision History](#) (Separate document - Current version: H (May 2012); Last revision: April 2010)

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Glossary

This manual supersedes the previous TRW Global Supplier Quality Manual (GSQM) Revision G, April 2010, and any Product Line specific manuals. This manual includes both the TRW Automotive and the TRW Automotive Product Line Specific Requirements. This manual is released electronically on the TRW Vendor Information Network website <http://vin.livmi.trw.com>, without any hardcopy publication. TRW Automotive reserves the right to make changes to this document as deemed necessary for the management of our business.

Management Message

Best Quality, Lowest Cost, Global Reach and Innovative Technology continue to drive our philosophy and performance at TRW Automotive. Full alignment with all TRW suppliers on these priorities is a critical component to our mutual success.


In addition, TRW Purchasing continues to refine its global part family commodity strategies with a view towards aligning our business needs and priorities with our global suppliers. Our objectives are to develop, grow, and extend our business relationships with TRW's supply base.

These six supplier launch and quality performance focus areas are our top priority:

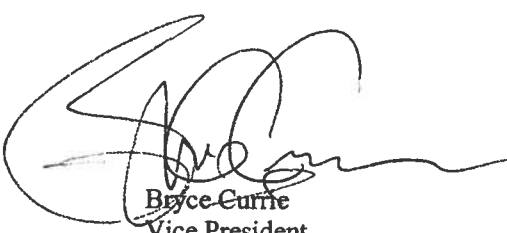
1. APQP & PPAP Quality of Event
2. Sub-Supplier Qualification and Management
3. Safe Launch Execution
4. Control of Special Processes such as Heat Treat, Plating and Welding
5. Annual Revalidations
6. Change notification, approval and implementation

In support of strategic actions in each of the areas above, TRW launched a new Supplier Scorecard on January 1, 2012. This revised assessment tool is easier to use and understand and provides a more accurate view of supplier performance as applied consistently to all suppliers by all internal TRW groups and functions. Our scorecard now includes several indicators of APQP & PPAP performance and more clearly identifies conformance to quality system and special process assessment requirements. It also links supplier performance directly to commercial and bid-list status for each supplier. We encourage all suppliers to actively review their scorecard and manage your performance accordingly.

We recognize TRW cannot succeed without the superior quality, cost, service and technology offered by its supply base. We are excited to continue our strong working relationship with you and drive for continuous improvement.



Martin Horneck
Vice President
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Section 1 – Introduction

1A. Policy and Vision

It is the policy of TRW to achieve a clear competitive advantage through continuous improvement in quality, service, delivery and cost from our suppliers in the total supply chain.

It is the vision of TRW that suppliers shall:

- **Do it Right the First Time** by planning, preparing, and being trained to supply quality products and services.
- **Do it Right Every Time** by assuring consistent quality products and services through addressing all concerns.
- **Continually Improve** by proactively improving the quality and value of products and services.

1B. Purpose

The purpose of this Global Supplier Quality Manual (GSQM) is to specify TRW Automotive quality system requirements for our suppliers. These requirements extend from supplier qualification, to new product development, to production.

1C. Scope

This manual applies to all external direct material/service suppliers, including sub-tier special process suppliers, i.e., heat treat, coating, plating, etc. This manual applies to indirect material/service suppliers only when it is required by a TRW Purchase Order.

1D. Responsibility

- Suppliers are responsible for meeting the GSQM requirements. Failure to meet these requirements may result in the loss of existing and/or future TRW business, in addition to reimbursement of costs to TRW resulting from those failures.
- Suppliers shall ensure that their direct material/service suppliers comply with the requirements of ISO/TS 16949:2009.
- Suppliers shall adopt the standards of Zero (0) Defects and 100% On Time Delivery to TRW. Suppliers shall understand that established PPM targets do not necessarily represent an Accepted Quality Level, but may be an intermediate continuous improvement step toward shipment of components/materials meeting the Zero Defects requirement.

1E. Document Location

This manual is distributed via the TRW website at <http://vin.trw.com>. Printed copies are considered uncontrolled documents. While TRW will communicate to suppliers major revisions to this manual, suppliers are expected to remain up to date on TRW requirements by frequently visiting the TRW website. Visiting this website should become a business routine as TRW uses web based communications and applications. Forms and documents referenced throughout this manual can be found in the GSQM documents download on the Vendor Information Network home page. Questions regarding this manual should be directed to the TRW contacts listed on the TRW website <http://vin.trw.com>.

1F. Language

TRW Automotive official language is English. All official communication with TRW will be done in English. Documents may display the native language when integrated in parallel translation. In this instance, English is the only valid version.

1G. Global Supplier Development Process

TRW Automotive Global Supplier Development follows a series of processes/procedures that have been defined as the TRW Automotive Supplier Development Process. This details the methods and tools used by Supplier Development and Supplier Quality from the initial assessment at a potential new supplier location through launch and into intensive supplier improvement and tactical monitoring within operations. The figure below depicts the product development stages starting with Concept Validation.

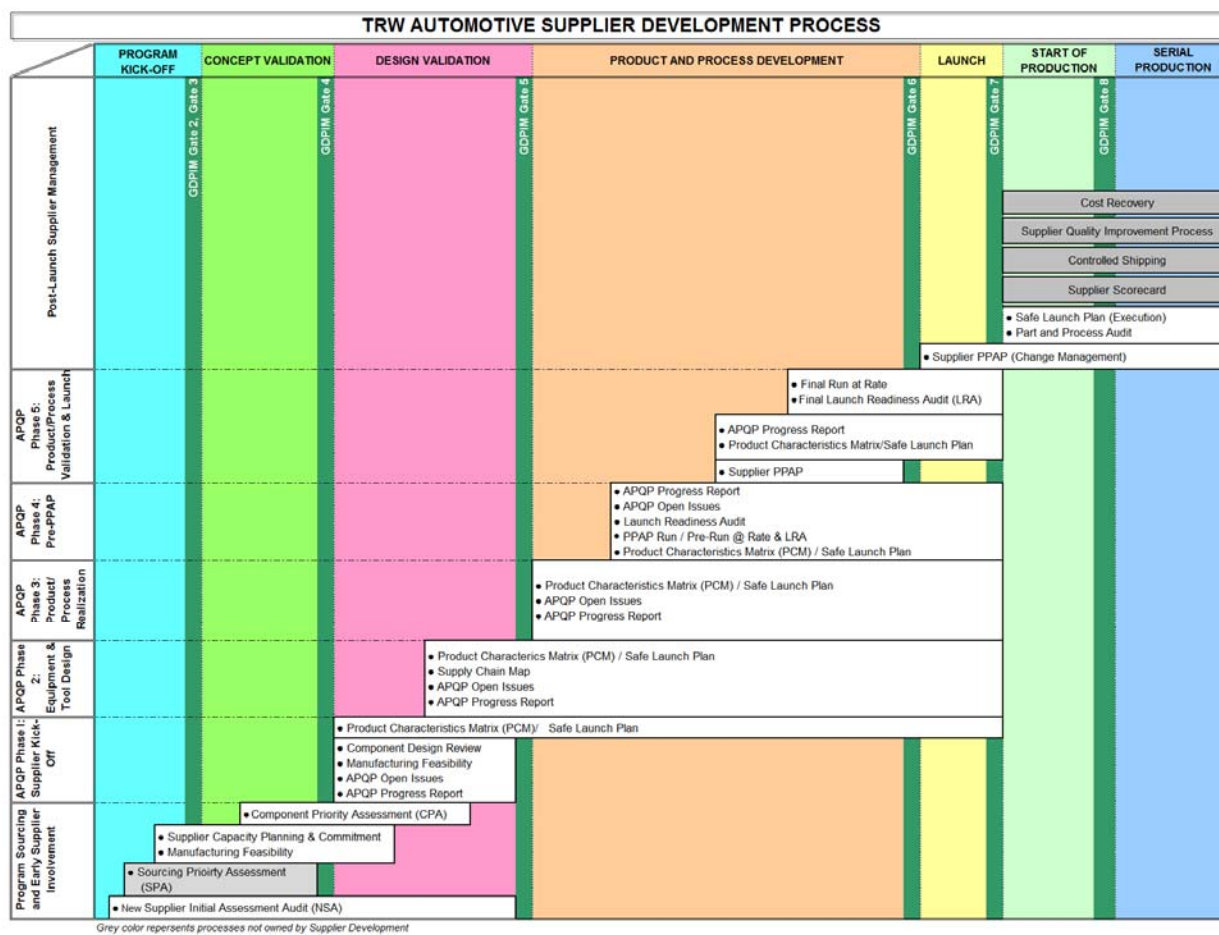


Figure 1. Global Supplier Development Process

TRW Automotive product development process, Global Development Product Introduction Management (GDPIM), initiates with the quoting process to our customers. Once TRW is awarded a program, engineering develops concepts to meet the customers' specifications and requirements. The process continues on to validation of the design (DV).

The next phase is the development of the product and the process. TRW facilities install assembly equipment, engineering work together with the customer to assure the product meets all performance and appearance (where applicable) requirements. During this phase, suppliers develop the tooling and

processes to provide material for future serial production. Also during this period, many suppliers will be required to supply components/materials for equipment tryouts and product validation (PV) builds and testing. Suppliers should also be constructing ramp-up plans to meet initial production requirements and creating contingency plans to address catastrophic events that would prevent the supply of materials under normal production conditions.

Suppliers will participate in Safe Launch Planning and execution as developed in the Product Characteristic Matrix (PCM). Per the component specific PCM, for a pre-determined period of time or number of components, the supplier and the TRW facility will employ an expanded inspection process on key characteristics. The supplier shall continue to use the validated process once the program transitions from Launch into Production. TRW's approval is required before implementing any changes to that validated process. Suppliers whose performance does not meet agreed goals and metrics during this process will be subject to one or more intensive improvement tools.

1H. Government Regulatory Compliance & Corporate Social Responsibility

TRW shall comply with all applicable laws, governmental regulations and rules in the countries in which it operates. TRW Automotive suppliers shall also comply with all applicable governmental regulations in countries in which they operate. These regulations relate to the health and safety of workers, environmental protection, use of toxic and hazardous materials, and free trade. Suppliers should recognize that applicable government regulations include those in the country of manufacture, as well the country of sale.

Furthermore, TRW shall also comply with the AIAG Global Working Conditions (GWC) Guidance Statement and expects its supply base to adopt and adhere to the GWC principles as referenced in the [AIAG Global Working Conditions Guidance Statement](#). These regulations include, but are not limited to safety, environmental protection, handling of toxic and hazardous materials, child and forced labor, wages & benefits, working hours, and free trade. Suppliers shall enforce policies which provide a safe and healthy workplace; protect the environment; promote human rights; provide equal opportunity for employees at all levels of the company, as well as provide access to vehicles which encourage training and development. In addition, suppliers are to engage in sound and ethical business practices in all business dealings.

Suppliers shall, upon request, provide evidence of adherence to these and other global requirements.

1I. Health, Safety & Environmental Protection

TRW Automotive promotes strong relationships with its suppliers and the supply chain to minimize Health, Safety and Environmental (HS&E) risks and impacts and prevent business interruption and damage to our reputation. These relationships should also be used to reduce total costs by carefully considering all costs, direct and indirect, associated with the acquisition of goods and services.

HS&E performance shall be included in the criteria for the selection and continued use of suppliers and must be assessed as part of the Supplier Quality Assurance (SQA) process. HS&E requirements should be considered similar to any other specification and supplier's conformance to them documented accordingly. TRW Automotive HS&E criteria are described as follows:

1. Customer Requirements - ELV/IMDS Compliance - Suppliers with chronic non-performance may be nominated for placement on bid suspension and/or new business hold.
2. International Standards - ISO 14001 Certification – Highly recommended & expected but not mandatory.

Suppliers are strongly encouraged to evaluate emerging issues that could impact HS&E and Corporate Social Responsibility at cr.aiag.org.

11.1 Environmental Guidelines

Many automakers and suppliers, including TRW Automotive, are convinced that the future and permanent protection of our environment, land, water and air can only be achieved through the joint efforts of industry, government and society. Top priority will be to strive for continuous improvement in environmental performance. This will be accomplished through the development of new products, processes and working methods that further enhance our environmental performance. We strive for economical use of raw materials, energy, water and other goods; and will fully consider the life cycle of our products through production, use and disposal. The environmental impact of our products during manufacturing includes both manufacturing at TRW and that of our suppliers. This means that both, we and our suppliers, must perform activities such that the impact of those activities on the environment is reduced to a minimum. We, therefore expect from our suppliers an active engagement in environmental concerns and the establishment and adherence to environmental management as per ISO 14001 or other equivalent standard. This does not release the supplier from complying with all relevant national and international regulations. Registration to ISO14001 is strongly recommended.

The techniques and methods below are those that we believe to constitute the prerequisite to reach the above-mentioned environmental targets:

- Written guidelines regarding the environmental performance
- Regular review of production, maintenance, supply and disposal processes and products to determine their environmental impact
- An emergency plan
- Definition of targets to improve environmental protection and documentation of their fulfillment which includes:
 - Safeguarding of resources (raw materials, energy, water)
 - Prevention and reduction of environmental pollution
 - Minimization of waste and rejects
 - Reduction of expendable packaging
- Compliance with all automotive regulations regarding materials and substances
- Have a recycling concept/program

11.2 Basic Requirements on the Environment Compatibility of Products

The use and consumption of energy and raw materials shall be managed effectively and with a minimum of logistics and transport over the entire vehicle/component life cycle. For a quantitative assessment of resource efficiency by way of life cycle analysis, the requisite data shall be provided upon request, material consumption, water consumption, total energy consumption, transport (raw materials), and emissions.

11.3 REACH

The European Regulation (EC) No. 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) entered into force in June 2007. Suppliers shall comply with all applicable REACH requirements that affect the products that they supply to TRW. TRW expects that suppliers will have a dialogue with their own supply chain and with TRW regarding all applicable aspects of REACH.

Suppliers are responsible for securing REACH authorizations for continued use of any materials or preparations containing REACH Annex XIV listed substances and to ensure that TRW's "use activity" is contained in the authorization. Other than certain specific exemptions, continued use of Annex XIV substances after the chemical's sunset date requires that an authorization for that use be granted by the European Chemicals Agency (ECHA). Authorizations under REACH are granted to individual manufacturers, importers and downstream users for specific use activities.

In particular, suppliers located outside the EU/EEA and export products (parts or materials) to TRW sites within the EU/EEA shall nominate an EU "only representative" to undertake any applicable REACH importer obligations.

11.4. Conflict Minerals

Suppliers in all regions shall be able to verify that the tin, tantalum, tungsten, and gold (3TG) contained within products sold to TRW did not originate within the Democratic Republic of the Congo, **OR** be able to determine the locations where the tin, tantalum, tungsten, and gold originated within the Democratic Republic of the Congo. Suppliers are to refer to AIAG for more information and details (www.aiag.org).

11.5. Product Regulatory Compliance & Standard for Control of Prohibited & Restricted Substances

Suppliers in all regions shall ensure that all components and materials supplied to any TRW Automotive facility comply with legal requirements.

To ensure compliance with the European End-of-Life Vehicle (ELV) Directive, 2000/53/EC as amended and other similar legal requirements, TRW has adopted a global standard entitled, "Standard For Control of Prohibited & Restricted Substances" ([B_080_3_01_EN](#)). This standard establishes TRW's prohibited and restricted materials and reporting requirements for all types of purchased materials, components or items. The requirements herein are intended to eliminate or reduce the presence of prohibited and restricted substances within those materials and components that are purchased for use by TRW. This standard has replaced previous specifications regarding substance restrictions released by TRW.

The ELV Directive was enacted "to minimize the impact of end-of-life vehicles on the environment". The ELV Directive prohibits the use of lead, mercury, cadmium, and hexavalent chromium in vehicles and vehicle components, except for certain exemptions published in Annex II of the Directive. In addition, other legal requirements, such as EU Directives 2002/95/EC, 2002/96/EC, and 2003/11/EC restrict the use of certain flame retardant substances: polybrominated biphenyls (PBBs) and polybrominated diphenyl ethers (PBDEs). PBBs or PBDEs and these shall not be present in components or materials supplied to TRW Automotive.

Suppliers of friction materials should refer to TRW's "Suppliers of Friction Material" ([HSE11-G-20, D_015_4_04_EN](#)) for additional guidance.

TRW's Standard For Control of Prohibited & Restricted Substances" ([B_080_3_01_EN](#)) is fully aligned with the Global Automotive Declarable Substance List (GADSL), which includes new substances identified in the "EU Regulation (EC) 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)". This standard also reinforces the need for suppliers to provide accurate material data to support EU Directive 2005/64/EC on the type-approval of motor vehicles with

regard to their reusability, recyclability and recoverability as amended by EU Directive 2009/1/EC" (RRR).

The material and component exemption expiration dates contained within the latest revision of EU Directive 2000/53/EC on end-of life vehicles Annex II must be complied with for all parts supplied to TRW. These requirements are updated and controlled within the International Material Data System (IMDS) reporting system which must be used in conjunction with this standard.

II.6 International Material Data System (IMDS) Reporting & Verification

To ensure compliance with the various legal and customer requirements, TRW requires its suppliers to report material and substance information for all types of purchased materials, components or items supplied to TRW. All substances and/or materials shall be reported to TRW using the International Material Data System (IMDS) (www.mdssystem.com).

Suppliers shall submit the required IMDS to TRW as soon as possible upon award of new business, but in any case prior to the PPAP submission. The supplier IMDS information shall be subject to TRW review and approval. Once approved by TRW, the supplier of the material or component shall indicate such approval in the PPAP documentation supplied to TRW, regardless of submission level requested. Refer to Section 2B.4, Production Part Approval Process (PPAP) for further explanation of the submission requirements.

The supplier shall also implement procedures or controls necessary to prevent the introduction of prohibited and restricted substances in materials as specified herein into the final product (component supplied to TRW).

Certificates of conformance from raw material suppliers may be used to guarantee the absence of prohibited materials as long as an analysis is made of the entire manufacturing process to ensure that all possible areas of material introduction are included. However, it is highly recommended that final product be subject to a chemical analysis to verify the absence of any prohibited materials.

TRW Processes and Procedures

TRW Product Line	TRW Region	Document Name	Document Number	Description
Automotive	Global	Standard for Control of Prohibited & Restricted Substances	B_080_3_01_EN	Establishes standard for control of prohibited & restricted substances and reporting requirements for all types of purchased materials, components or items
		Suppliers of Friction Material	HSE11-G-20, D_015_4_04_EN	Prohibits friction materials containing asbestos fibers

1J. Quality Assurance Agreement

TRW European and Asia-Pacific operations may request this agreement from all suppliers to their organization. It controls both the supplier's and TRW's responsibilities and tasks for the key quality processes in respect to the Global Supplier Quality Manual (GSQM) and the legal requirements of specific countries. The supplier is responsible for review of the Quality Assurance Agreement, when provided.

Product Line Specific Processes and Procedures

TRW Product Line	TRW Region	Document Name	Document Number	Description
Automotive	Europe; Asia/Pacific	Quality Assurance Agreement	GSQM-190A	Quality Assurance Agreement
Occupant Safety Systems	Europe	Quality Assurance Agreement Guideline	GSQM-OSS 10.40G	Procedure that defines the purpose and scope of the Quality Agreement
		Quality Assurance Agreement Form	GSQM-OSS 10.40F	Quality Assurance Agreement form

Section 2 - TRW Automotive Requirements

TRW Automotive supply management requirements are based on four key processes. These are supplier selection, new product launch, continuous improvement, and supplier intensive improvement. These key processes are global in nature, as are any of their referenced procedures. In some instances, because of unique system configurations, product lines and regions may have specific processes, procedures, and/or forms that may only pertain to conducting business with them. These unique requirements will be found in a table at the end of each section.

2A. Criteria for Selection as a TRW Automotive Supplier

2A.1 ISO/TS 16949:2009 Registration

The goal for all TRW Automotive suppliers of materials and services affecting production material is to demonstrate compliance to ISO/TS 16949:2009. Suppliers shall also comply with TRW Automotive specific requirements defined in the Global Supplier Quality Manual (GSQM), found at <https://vin.trw.com/>.

Suppliers to TRW Automotive shall have a plan to achieve conformity to ISO/TS 16949:2009.

Unless otherwise specified, conformity may be demonstrated by third party certification to ISO 9001:2008 (at minimum) or ISO/TS 16949:2009. Note that certification to this specification will only be accepted when issued by an IAOB recognized registrar. This is consistent with the expectations of TRW's customers and our business system that complies to ISO/TS 16949:2009 requirements. The scope of the requirement affects subassembly, sequencing, sorting, re-work and calibration services in addition to direct material suppliers.

Suppliers who are identified as special process providers are to adhere to the specific requirements as set forth in the AIAG manual.

TRW Automotive does not have a special policy for ISO/TS 16949:2009 compliance for small businesses. TRW Automotive expects all of their direct material suppliers meet the above stated criteria

Note: QS-9000 or VDA certification does not replace the requirement to have a ISO/TS 16949:2009 conformity plan, nor does it replace certification to either ISO 9001:2008 or ISO/TS 16949:2009.

Additionally, suppliers shall, at minimum, maintain and update their certification status once per year. Suppliers shall immediately communicate any change in certification or status to their respective commodity manager and SDE. Suppliers are to provide and upload proof of their quality and other pertinent certifications in the Vendor Information Network (<http://vin.livmi.trw.com>). Failure to upload the latest certification "will" result in New Business Hold (NBH). Certification status is accessible to suppliers through their scorecard which is updated monthly in the Vendor Information Network (VIN).

TRW Automotive requires that its suppliers use the latest Automotive Industry Action Group (AIAG) version of the Advanced Product Quality Planning and Control Plan (APQP), Potential Failure Mode and Effects Analysis (FMEA), Measurement System Analysis (MSA), Production Part Approval Process (PPAP), and Statistical Process Control (SPC) manuals as guidelines for their system development.

For these publications, visit <http://www.aiag.org>.

2A.2 e-Business Capabilities

Suppliers shall have email, Internet access and Internet browser as a minimum for eBusiness capability. This is required to participate in TRW's web based applications and communications. These include but are not limited to:

- Supplier Master
- Measure of Performance System (MOPS)/Supplier Scorecard
- Concern Tracking System
- Program Tracking System
- Supply Visualization, EDI
- Supplier Audit Database (SAD)
- Global Supplier Quality Manual (GSQM)
- Electronic Requests for Quotations (e-RFQ)
- Value Management Database

Suppliers are responsible for maintaining contact information in the Vendor Information Network - Supplier Master. These contacts include top management representatives and the required information includes phone numbers and email addresses.

It is expected that all suppliers will access VIN at least once per day.

2A.3 New Supplier/Location Qualification

New suppliers who wish to be a supplier to TRW Automotive shall:

- Demonstrate compliance at a minimum to ISO9001:2008
- New suppliers, who have not completed their registration process, may be awarded business on the condition, unless otherwise specified by a customer to TRW, that they successfully pass the New Supplier Audit and have a reasonable plan to meet the GSQM and ISO/TS16949 requirements
- Meet all commercial and financial requirements of the relevant TRW product line
- Complete the [Supplier Questionnaire](#) (D_010_4_03)
- Successfully pass a TRW [New Supplier Assessment Audit](#) (D_020_4_07) with a minimum score of 80%. Guidelines for this audit are located in the [New Supplier Assessment Audit Protocol](#) (D_020_4_06)

New locations for approved suppliers to TRW Automotive shall:

- Demonstrate compliance at a minimum to ISO9001:2008. Uncertified locations with more than 12 months of operation experience are eligible for certification to ISO/TS16949. Those facilities with less than 12 months of operation will need to contact their registrar regarding qualification for a Letter of Conformance.
- Complete the [Supplier Questionnaire](#) (D_010_4_03)
- Successfully pass a TRW [New Supplier Assessment Audit](#) (D_020_4_07) with a minimum score of 80%. Guidelines for this audit are located in the [New Supplier Assessment Audit Protocol](#) (D_0204_06)

Suppliers directed for use by TRW customers shall meet the criteria defined by this document.

2A.4 New Supplier Assessment Criteria

During supplier selection and assessment, TRW will perform various audits to confirm supplier capability, beyond the certification level. The primary focus areas are depicted in **Figure 2** below. Suppliers that initially do not score acceptably will be allowed to develop action plans and timelines to correct any deficiencies and then request a re-audit to verify implementation of these actions.

Section (Weight)	Quality Management (15%)	Product Planning (15%)	Sub-Supplier Management (10%)	Quality Control (15%)	Manufacturing (20%)	Leadership (10%)	Commodity Specific (15%)	Total Weighted Score
Score	88	78	80	69	64	63	69	73
Pts Awarded/ Total Pts Avail	7 / 8	14 / 18	8 / 10	18 / 26	47 / 74	5 / 8	18 / 26	117 / 170

NOTE: FAILURE TO SCORE "2" ON A 'KEY QUESTION' OR SCORING BELOW 60 WITHIN ANY CATEGORY WILL RESULT IN FAILING THE AUDIT.

Summary Remarks - (Reference "SWOT" Worksheet for Details)

Certification / Special Process Assessments	Date:	By Whom:	Result / Remark:

Initial Audit O/A Score / Date	Follow-up Audit O/A Score / Date	Follow-up Audit O/A Score / Date

Supplier: <input type="text"/>	Audit Date: <input type="text"/>	<div style="background-color: green; color: white; padding: 5px; text-align: center;"> Score Valid for 1 Year After "Audit Date" If Not Awarded TRW Business </div>	≥ 80	Systems meet or exceed requirements (Minimal Risk)
Address: <input type="text"/>	Country: <input type="text"/>		≥ 60 < 80	Systems acceptable, but improvement is needed. (Intermediate Risk)
City / State: <input type="text"/>	SELECT COMMODITY <input type="text"/>		< 60	Systems unable to meet requirements (High Risk)
Commodity: <input type="text"/>	SELECT COMMODITY <input type="text"/>			
TRW SDE: <input type="text"/>	TRW SDE: <input type="text"/>			

Supplier Development Plan Required: ☐ YES ☒ NO **Development Plan Start Date:**

Sign-Off: Senior Supplier Representative (At Supplier)			
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Print Name	Signature	Title/Position	Date
Sign-off: Lead TRW SDE (at Supplier)			
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Print Name	Signature	Title/Position	Date
Sign-off: Lead TRW SDE Mgr Region			
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Print Name	Signature	Title/Position	Date
Sign-off: Lead TRW SDE Mgr Product Line			
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Print Name	Signature	Title/Position	Date

Supplier Business Award Eligibility	
<input type="checkbox"/> Yes	Supplier meets TRW requirements and is eligible for business award.
<input type="checkbox"/> None - Potential	Supplier has not met TRW minimum requirements and is deemed not eligible for business award. However, supplier may be provided opportunity to offer competitive quotes. A supplier development plan and action to improve NSA result is required to be eligible for business award.
<input type="checkbox"/> None	Supplier does not meet requirements and has not provided evidence to indicate further development should be initiated.

Figure 2. New Supplier Assessment Cover Page (Example)

2B. New Product Launch

2B.1 Introduction

New Product Launch initiates at design concept and runs through production launch of a new component. When specified by the TRW SDE, suppliers shall use the TRW Global Supplier Development Management Process (**Figure 1**) when launching new product for TRW Automotive. TRW Automotive New Product Introduction teams will define component priority during the product development cycle. This designation determines the involvement of TRW Supplier Development in the APQP and launch process of suppliers. All suppliers, regardless of component priority, shall use a disciplined launch and APQP process.

TRW Automotive has an electronic APQP and PPAP system available for use by suppliers called the Program Tracking System (PTS). There is no cost for use of this system. Suppliers will use PTS when notified by VIN that they have tasks to be completed. This system includes on-line copies of the Supplier Capacity Planning & Commitment and Manufacturing Feasibility forms. Suppliers will also be notified by email when they are expected to complete these forms on-line.

2B.2 Advanced Product Quality Planning (APQP)

Suppliers should provide APQP status reports for a new product with regard to meeting the Program objectives of quality, cost, performance and timing. TRW will provide the format, frequency, and the required content of these reports. TRW prefers their suppliers to use the forms included in this document. Suppliers whose components/materials that TRW has designated as Category A shall use the TRW Automotive forms available through this manual, and **should complete those forms in English**. Suppliers who wish to use an alternative format shall contact their Supplier Development Engineer and demonstrate equivalency between the forms before any submission is made. When required, suppliers shall use TRW's online reporting system for Program tracking.

Suppliers to TRW are responsible for managing their new product introduction process to the guidelines provided in this document. TRW's APQP process consists of five phases as shown below. **Figure 3** shows the deliverables for the five phases.

APQP-1

This is the "Kick-off" phase. It begins once the supplier has been awarded new business. During this phase TRW and the supplier define the key milestones, review of the suppliers time line, conduct, when applicable, a detailed design review, and establish deliverables and expectations of the supplier for the given component and program. This activity creates the foundation for the phases that follow. See **Figure 3** for phase details.

APQP-2

This phase represents the span of time during which the supplier completes designs for their tooling, assembly lines/cells, gauging and identifies additional capital equipment required to manufacture the component/material. **Figure 3** details the deliverables in this phase.

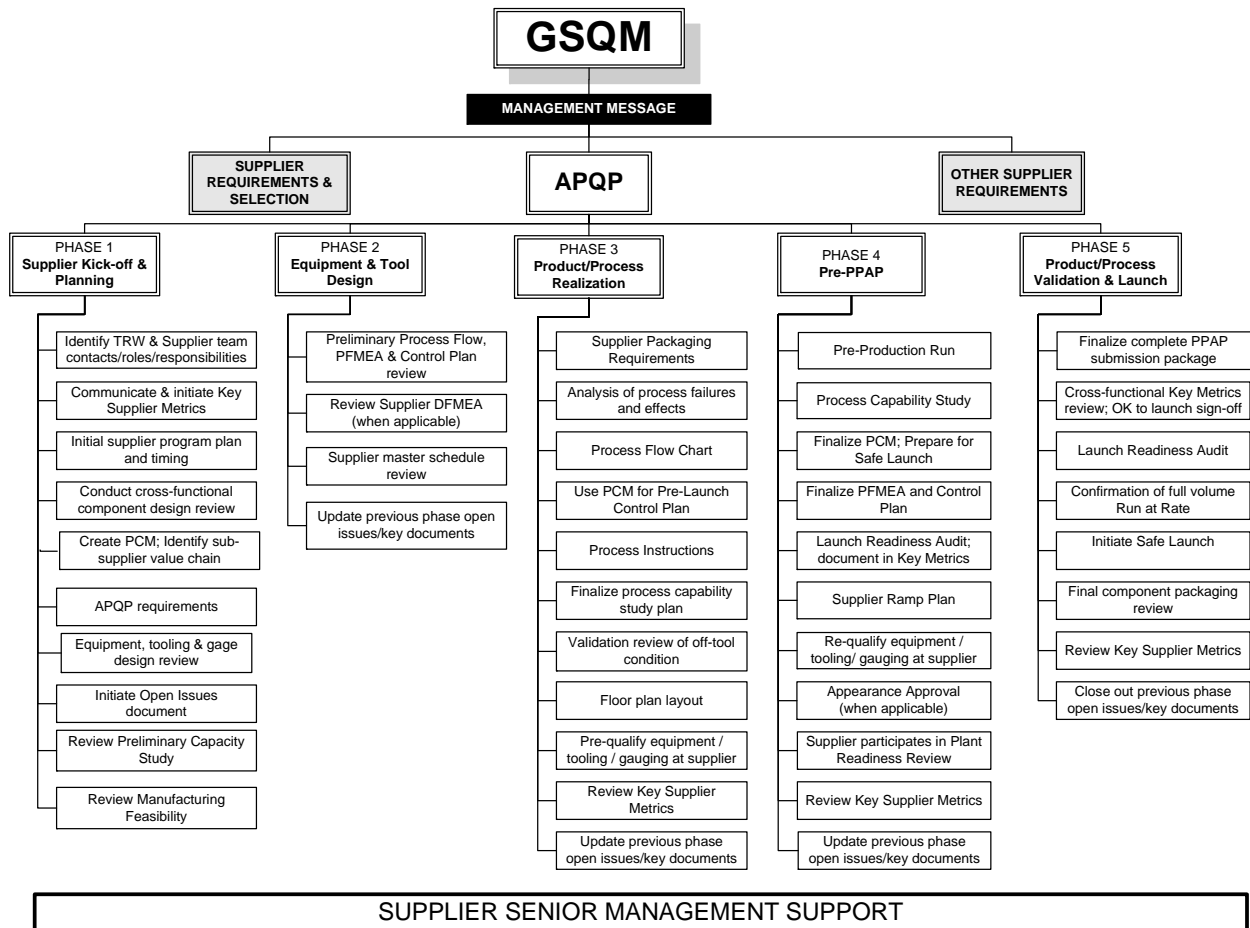


Figure 3. APQP: Phases 1-5

APQP-3

This phase starts with the supplier's direction to their manufacturers of the tooling, capital equipment, assembly cells and/or gauging to proceed and ends with the approval to ship the completed items. The supplier shall collect data required to assure that the manufactured items meet drawing, specification and capacity requirements before approval to ship is given. See **Figure 3** for further detail.

APQP-4

This is the Pre-PPAP or Pre-Validation phase. This phase starts with the delivery of the tooling, capital equipment, assembly equipment and/or gauging to the supplier's facility. It ends with the completion of the PPAP production run. The critical activity in this phase is the first parts off review, by the supplier, and subsequent tuning of the process to produce components/material that conform to the drawings and specification. See **Figure 3** for further detail.

APQP-5

This phase is the Product and Process Validation and Launch stage of the process. During this period, the supplier completes and submits a Production Product Approval Process (PPAP) package. A final review and sign-off is conducted in the VIN Program Tracking System (PTS) for approval to ship. See **Figure 3** for further detail.

As stated previously, regardless of component/material complexity, every supplier is expected to conduct and execute an APQP process. Suppliers who wish to use reporting formats other than those defined in this document shall have written approval from their SDE. Determination of Manufacturing Feasibility

will be required for every new or modified product design or manufacturing process based on engineering changes. Additionally, the Manufacturing Feasibility form will be signed by the supplier and product/applications engineer at the end of a Design Review to document consensus on the manufacturability of the component/material that is the subject of that review. The Supplier Capacity Planning & Commitment form is to be completed and submitted as part of the Request for Quotation (RFQ) and after Design Review.

Product Line Specific Processes and Procedures

TRW Product Line	TRW Region	Document Name	Document Number	Description
Automotive	Global	Manufacturing Feasibility Sign-Off	D_020_4_16	Manufacturing Feasibility Sign-off form
Automotive	Global	Supplier Capacity Planning & Commitment	D_020_4_14	Supplier capacity verification form
Occupant Safety Systems	Europe	Manufacturing Feasibility Sign-off Guideline	GSQM-OSS 20.10G	Defines purpose and procedure for completing the Manufacturing Feasibility form
		Capacity Verification Procedure	GSQM-OSS 20.70G	Describes procedure to define preliminary process capacity
		Capacity Verification Form	GSQM-OSS 20.70F	Form used to document preliminary process capacity

Key TRW Automotive global APQP events/forms required to be developed and submitted through PTS or the APQP workbook are:

- **Supply Chain Map** – A pictographic layout of all the sub-tier contributors to any given component, or family of components, starting with the raw material supplier and ending with the TRW using plant(s). This document shall include services that directly affect the production material, including heat treat, plating or coating, secondary operations, 3rd party warehousing, etc. This document is a foundation to the Product Characteristic Matrix and will also be used to document the lot traceability from the lowest tiers raw material to the finished product (**Figure 4**).
- The **Product Characteristic Matrix (PCM)** is generated at the Design Review and is completed as the validation process progresses. (**NOTE:** For those components and materials that do not require a Design Review, the supplier shall use this document to submit summary process capability results as part of their PPAP package.) This document links designated and high Risk Priority Number (RPN) ranked features with the identified controls. It also drives the identification of sub-tier suppliers who have an impact on these features, documenting what controls they have established. Suppliers may use this document in support of the Pre-Production Control Plan; assuring product is manufactured under controlled conditions and meets the drawing and specification requirements. The Safe Launch Plan is formulated using this document, when required.

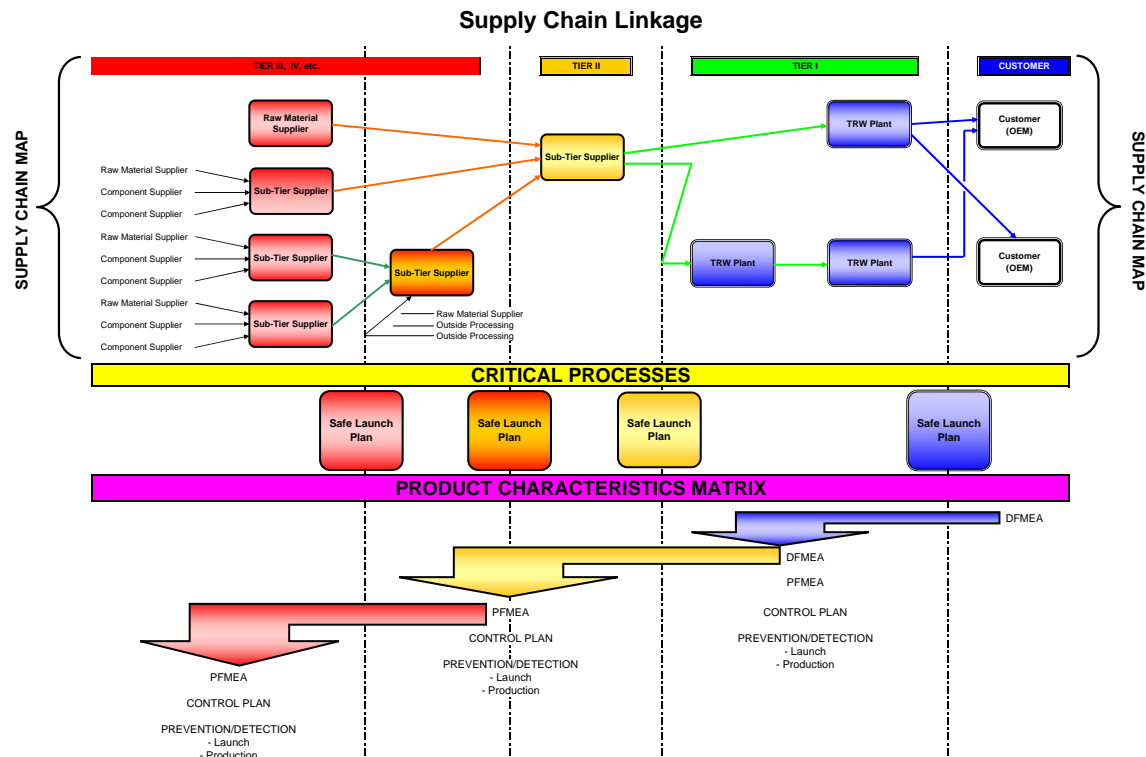
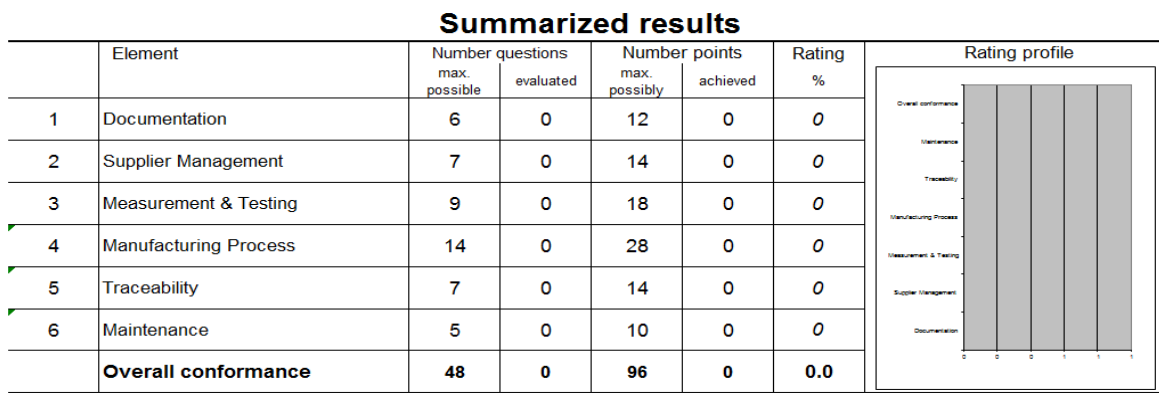


Figure 4. Supply Chain Linkage

- **Supplier Component / Process Design Review** - a formal drawing and validation plan review involving a TRW cross-functional team and the supplier. This is a key event in the APQP process. Suppliers shall conduct an internal design review before attending any reviews held by TRW. It is also beneficial for suppliers to invite representatives from their sub-tier suppliers to join their team for this meeting. The SDE shall generate an action plan based on the open issues discussed during the review and will follow-up with all responsible parties to assure timely closure of those issues. The Manufacturing Feasibility Sign-Off form (D_020_4_16) will be updated and signed by the supplier and product/applications engineer at the end of a Design Review to document consensus on the manufacturability of the component/material that is the subject of that review.
- **Launch and Production Readiness Audit (LRA)** - a score-based audit of the production process status and the supplier's plan to meet new production ramp-up. This score assesses the state of readiness of the supplier's process. All non-conformances are to be documented in an open issues list and require an action plan. Once all open issues have been addressed and a score of 80% has been achieved, the LRA is updated to reflect successful completion. **(Figure 5)**



Evaluation & Assessment Matrix	
Result %	Description
80 - 100	MEETS REQUIREMENTS: Supplier process is capable of meeting requirements for serial production.
60 - 79	MINOR NON-CONFORMANCE(S): Supplier allowed to ship production material with corrective action plan and containment.
0 - 59	MAJOR NON-CONFORMANCE(S): Supplier's process is incapable of supporting serial production requirements. Corrective Action and containment required.
Critical Question Failure	Critical Question Failure: One of the 4 critical questions (highlighted in green) in the LRA does not have a score of 2 points. All 4 of these questions must have a passing score (2 points) or the audit will automatically fail.

Figure 5. Supplier Launch Readiness Audit

- **Supplier Run at Rate** - a formalized production capacity study that verifies proper cycle times, quality expectations and yields. For all new components, all suppliers, regardless of priority rating, are expected to complete and submit a copy of the Run at Rate Verification form when submitting their PPAP package. Data collected during the supplier PPAP run may be used for the initial Run at Rate. The SDE will notify the supplier when they will be present during the initial and/or final Run at Rate event. All open issues must be documented and tracked.
- **APQP Progress Report** - a supplier maintained document that summarizes the requirements and progress of key APQP deliverables for key events and components. For TRW Product Lines using PTS, suppliers must submit this information on-line.
- **Supplier APQP Open Issues** - is the single format used to document all open issues and their respective corrective actions that arise during the APQP process. Suppliers may submit this using the APQP Workbook only to TRW Product Lines not using PTS.
- **Safe Launch Plan** (Dual Launch Netting, Pre-Launch Control Plan, etc.) - a joint effort between the supplier and TRW to have similar Pre-Launch Control Plans at both the shipping and receiving facilities. Safe Launch Plan requires the creation of a Pre-Launch Control Plan, an enhancement to the supplier's Production Control Plan. The implementation of an elevated, short-term Quality Inspection process is required. Safe Launch Plan plans will be documented using the Product Characteristics Matrix and shall be signed-off by the Supplier, TRW SDE and plant SQA representative. Suppliers will be required to submit data to the using plant(s) as part of this process. Suppliers shipping parts under Safe Launch Plan shall create a separate label, placed on each container, showing "SLP" to indicate these parts. See **Figure 6** for an example.



Figure 6. Example of a Safe Launch Plan Label

- Exit criteria for the Safe Launch Plan is shipment of zero defect parts that meet either the defined period of time or number of pieces. Any defect discovered during the SLP period restarts the event to "0" pieces shipped.

Three key documents that are also associated with advanced quality planning are the Process Flow Diagram, PFMEA, and Control Plan. TRW has definitive expectations, for these documents, that suppliers shall comply with.

Process Flow Diagram

- Shall define the entire process flow starting with Receiving Inspection and finishing with Packaging and Shipping.
- Shall include any sub-tier, or outside, suppliers, along with the names of those suppliers.
- Shall include machine numbers or unique identifiers that reflect what has been approved as part of the process. Suppliers shall identify those operations linked to the manufacturing of features identified by special characteristics.

Process Potential Failure Modes & Effects Analysis (PFMEA)

Unless otherwise specified, suppliers shall:

- Use the latest AIAG Potential Failure Mode & Effects Analysis (PFMEA) manual as the basis for creating this document.
- Shall follow flow established in Process Flow Diagram.
- Failure modes shall include designated characteristics from the TRW drawing in addition to the process and tooling based items.
- Suppliers shall have a process in place to report on their highest RPN numbers. This report may be in the form of a Pareto chart, displaying the RPNs from highest to lowest. This system shall include documentation of recommended actions and verification of their implementation.
- The PFMEA shall be used as a continuous improvement tool. Suppliers shall be able to document continuous improvement efforts derived from RPN rankings below their target value for improvement actions. Suppliers can prioritize their activities based on Number of RPNs vs. current performance, as shown in **Figure 7**.
- PFMEA's should show a direct linkage from the DFMEA. DFMEA severity ratings should carry over to the PFMEA as well as the marking of Critical and Significant Characteristics.
- Supplier shall make PFMEA available for review at TRW's request

Control Plan

- The Control Plan shall appropriately reflect the same steps and flow established by the Process Flow diagram and PFMEA.
- The Control Plan shall include all features, characteristics and notes with special consideration to those designated as special characteristics (see 2.B.6). Each product line and/or region uses a unique set of special characteristics. Please see your SDE for those that affect your components. If a supplier ships to multiple regions or product lines, contact your SDE for each product line/region to get all of the special characteristics affecting the components/materials your company supplies.
- Annual revalidation is to be included as an item on the Control Plan and suppliers will specify features, characteristics and notes that are to be included in the annual revalidation package.
- The control plan shall include the Safe Launch Plan controls, when used based upon the Product Characteristic Matrix (PCM).
- Refer to the PPAP Checklist as reference for other requirements relating to the Control Plan (i.e., sampling to be quantity based, not time).

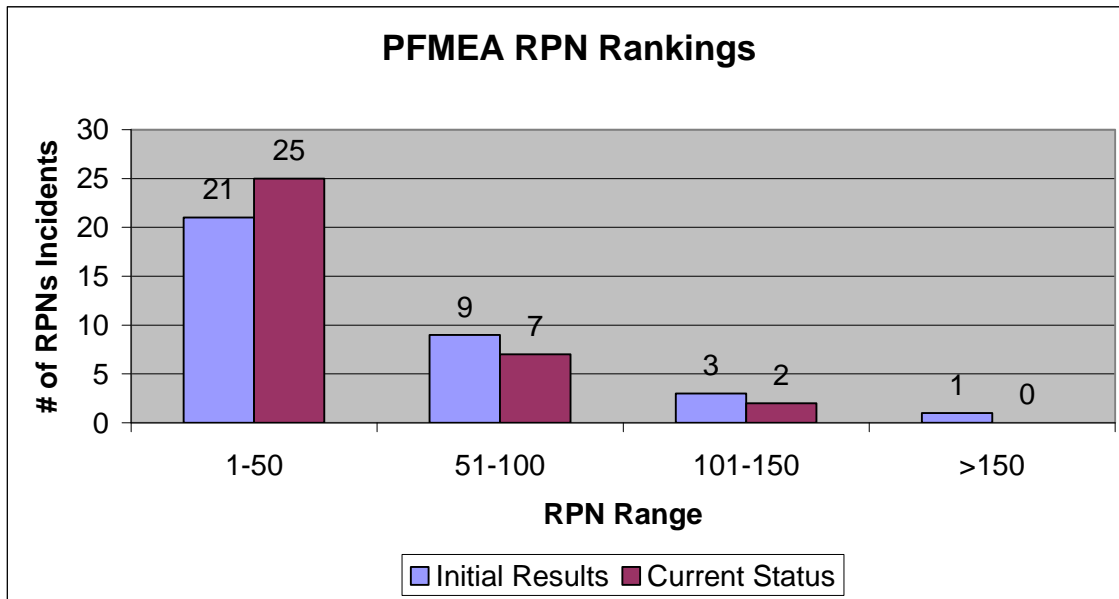


Figure 7. Example of PFMEA RPN Ranking by Range

2B.3 Packaging and Labeling

TRW and suppliers shall agree upon the packaging plan during APQP, including the following requirements.

- There shall be only one part number in a box or packaging unit.
- All packaging units shall be labeled and the label shall include:
 - TRW part number with engineering level and part description.
 - Quantity.
 - Supplier name and TRW supplier code.
 - Lot traceability number and date -- this number shall have a direct relationship with Delivery Note supplied. Starting with the Delivery Note, the supplier shall be able to trace all the documents and record. TRW, at its discretion, may specify additional traceability requirements.
 - Raw material Heat number, if requested.
 - A Bar Coded label applied to each packaging unit. TRW facilities may specify their own bar coding formats. Suppliers shall meet the bar code requirements of the TRW location they are shipping to.
- Suppliers, regardless of the manufacturing location, shipping to TRW's North American facilities shall meet the requirements found in the North American Labeling Requirements (see table below).
- Suppliers are expected to work with the receiving plant, or plants, in defining their packaging.

Suppliers providing product to multiple operating units, on a global scale, shall work with each of the locations to assure that the packaging is sufficiently robust to withstand shipment by sea and arrive on time, without damage.

TRW Automotive expects their suppliers to conduct, periodically, dock audits on packaged materials. Evidence of these audits shall be retained with other lot inspection documentation.

Product Line Specific Processes and Procedures

TRW Product Line	TRW Region	Document Name	Document Number	Description
Automotive	North America	North American Labeling Requirements	WA.D20.001	Specification for bar coded labels.
Braking, Linkage & Suspension, Steering	Global	Keep Separate Label	GSQM-150	Label to segregate material not for production.
Braking, Linkage & Suspension	Europe	Packaging Instruction Form	GSMCE-001	Packaging instruction PPAP form.
		Packaging Instruction Form - Example	GSMCE-002	Example of Packaging instruction PPAP form.
Occupant Safety Systems – Airbag	Europe	Guideline for Barcode and Labeling		Instructions for effective labeling of supplier's components.
TRW South America	South America	Sample Part Label	FOR 03006	Form for supplier to identify what the sample parts are being submitted for.

2B.4 Lot Traceability

All suppliers to TRW Automotive shall have an effective lot definition and traceability procedure. The shipper number will be linked to the lot traceability procedure in such a way that the delivered product, unless otherwise approved in writing by the TRW Supplier Development Engineer, can be traced back to the raw material. The maximum size of a lot shall consist of one shift, or eight hours of production, whichever is smaller. For Bulk Processes, lot size may be defined by quantity and vary based on process/production equipment. TRW reserves the right to specify a maximum batch size. The lot definition shall reflect all significant processes influencing the component/material, with the shipping lot number reflecting the last value added operation. Suppliers shall ensure that their lot traceability system maintains its integrity throughout entire extended supply chain, including not only raw material, but also purchased components/products.

Many components lifeline begins and ends within the facility of the supplier. There are those components, however, that do require processing by outside companies to finish the process stream. These may include heat treat, coining, grinding, coating, and other various processes.

If the original lot were batch processed through the different secondary processes, then there would be no need to change the original lot number. However, if the batches are split at a secondary processor, then the lot number for each of the batches should be unique.

Once manufacturing/assembly begins, a lot number is changed if:

- One shift of production or eight hours is reached.
- The lot number changes on the raw material being used.
- When the components undergo another value added process and the original lot is divided during processing.
- The lot number changes on any one of the components being used.

When required, the supplier may need to implement:

- *Serialized* (maintains a one-to-one relationship between the finished good serial number and the components' serial number) lot traceability, or
- *Specific Lot* (maintains a one-to-one relationship between the finished good serial number and the components' lot numbers) traceability for certain programs. To clarify the difference between this and general traceability, consider a supplier who stamps a given component. After stamping, two fasteners are pressed into the stamping. General traceability is where there is no lot traceability between the stamped component and the assembled parts. Specific traceability would be where the lot numbers of the assembled components are traceable through the lot number of the stamped component.

For safety/critical parts, the required retention time for Lot Traceability records shall be found in **Section 2C.9**.

2B.5 Production Part Approval Process (PPAP)

Suppliers shall ensure that PPAP documentation and sample submissions are in accordance with the requirements of the latest edition of the Automotive Industry Action Group (AIAG) PPAP Manual. Suppliers shall only submit PPAP packages for production-released drawings, and a copy of this drawing shall be included in the submission package. Each supplier is responsible for meeting all these requirements before submission to TRW, including obtaining TRW approvals for any change requests.

Suppliers will be requested to submit the PPAP package in an electronic format by one or more of the product lines and regions via the TRW Program Tracking System (PTS). In these instances, suppliers must be prepared to comply with these requests.

TRW has established a global PPAP validation requirement that further defines submission levels, including what the supplier submits and/or retains (see **Figure 8**). The order that the package is to be organized is indicated in the TRW Number column. Suppliers should use the forms identified in the AIAG PPAP manual or those provided through PTS. Suppliers may use their forms only if they are equivalent to the AIAG forms and if they have the written approval of the TRW SDE. TRW may require suppliers to submit a validation package that contains additional documents and forms beyond those required by AIAG. In addition, the supplier is responsible for all sub-tier PPAP submissions and approvals, including those suppliers TRW has directed for use. A PPAP Checklist is available for suppliers to use; assuring that the submission meets TRW's expectations.

For all new components and materials, suppliers shall submit with the validation package a copy of ELV/IMDS Reporting verification and screenshot from IMDS system showing acceptance. This form verifies the submission of End-of-Life Vehicle component content. Based on the absence of this document, TRW will not approve the PPAP submission.

Suppliers of plastic components to TRW Automotive are required to comply with regrind levels specified on the component's drawing. Components produced throughout the APQP process, including DV, PV, and PPAP, shall be representative of the maximum **allowable regrind and confirmed by certified laboratory analysis**. Additionally, suppliers are responsible to assure that the component's PFMEA and Control Plan specifically address and control this requirement.

Supplier submission of a non-conforming PPAP package will be recorded as a supplier performance failure and could affect the supplier's performance rating. TRW will determine the Level of PPAP submission, and any special requirements if applicable.

When applicable, suppliers shall include in the PPAP submission the Engineering Specification (ES) test plan and the ES test results. An approved/accredited laboratory shall conduct the ES tests.

For standard catalog purchased components, i.e., diodes, resistors, etc., that do not go through the PPAP process, based on a product line decision, are to be considered as approved components.



PPAP Submission Requirements

AIAG PPAP Manual								
TRW Requirement		Production Part Approval Process		PPAP Submission Level				
No.	TRW Form No.	No.	Document	1	2	3	4	5
1	Ref AIAG PPAP Manual	18	Part Submission Warrant	S	S	S	S	S
2	--	1	Design Records (Drawings, Specifications)	R	S	S	*	R
3	Product Line Specific, GSQM Section 2.C.2	2	Change Documents, if any	R	S	S	*	R
4	--	3	Customer Engineering Approval Documents, if any	R	R	S	*	R
5	Ref AIAG FMEA Manual	4	Design FMEA	R	R	S**	*	R
6	--	5	Process Flow Diagram	R	R	S	*	R
7	Ref AIAG FMEA Manual	6	Process FMEA	R	R	S**	*	R
8	Ref AIAG PPAP Manual	9	Dimensional Results	R	S	S	*	R
9	Ref AIAG PPAP Manual	10	Material & Performance Test Results	R	S	S	*	R
10	Product Characteristic Matrix (D_020_4_03)	11	Initial Process Study (Process Capability Summary)	R	R	S	*	R
11	Ref AIAG MSA Manual	8	Measurement Systems Analysis (Gage R&R)	R	R	S	*	R
12	--	12	Qualified Laboratory Documentation	R	S	S	*	R
13	Ref AIAG APQP Manual	7	Control Plan	R	R	S**	*	R
14	Ref AIAG PPAP Manual	13	Appearance Approval Report, if applicable	S	S	S	*	R
15	Ref AIAG PPAP Manual	-	Bulk Materials Requirement Checklist (bulk matl PPAP only)	S	S	S	S	R
16	--	14	Sample Product	R	S	S	*	R
17	--	15	Master Sample	R	R	R	*	R
18	--	16	Checking Aids	R	R	R	*	R
19	--	17	Records of Compliance with Customer Specific Requirements	R	R	S	*	R
Additional TRW PPAP Requirements								
20	D_020_4_20	--	Safe Launch Plan	*	*	*	*	*
21	--	--	Packaging Plan and Sample Label	R	R	S	*	R
22	D_020_4_16	--	Manufacturing Feasibility Sign-off	*	*	*	*	*
23	D_020_4_14	--	Supplier Capacity Plan	*	*	*	*	*
24	Ref AIAG PPAP Manual	--	Sub – contractor PPAP status (Supplier Part Warrant Letter(s))	S	S	S	S	R
25	GSQM-151	--	Certification of Review**	*	*	S	S	R

R= Retain at supplier
S= Submit to customer

* The supplier shall retain at appropriate locations and submit to customer upon request.

** For European/Asia/Pacific suppliers to TRW Chassis: In the case where a supplier does not attach Design FMEA, Process FMEA and Control Plan for components/assemblies due to confidentiality issue, supplier shall arrange a date of review with the TRW SDE /plant SQE who adds the Certificate of Review to the PPAP folder.

Shaded boxes are required to be submitted with the PPAP package.

Figure 8. TRW Automotive PPAP Submission Levels

Product Line Specific Processes and Procedures

TRW Product Line	TRW Region	Document Name	Document Number	Description
Automotive	Global	PPAP Checklist	D_020_4_19	Checklist to be used by both supplier and TRW Approver to assure a complete and correct PPAP package.
Steering	North America	Supplier Drawing and PPAP Requirements Notification	GSQM-135	PPAP requirements notification form.
Occupant Safety Systems	North America	Supplier Drawing and PPAP Requirements Notification	QF0680-01	PPAP requirements notification form.
Braking, Linkage & Suspension, Steering	Europe; Asia/Pacific	Certificate of Review	GSQM-151	Form certifying the review of the supplier's PMFEA and Control Plan.
Occupant Safety Systems	Europe	Guideline for PPAP (Richtlinie Zum Produktionsteil – Abnahmeverfahren PPAP)	GSQM-OSS 20.60G	Guideline for PPAP Submissions
		Deviation Overview	GSQM-OSS 20.6F4	Form that details non-conformance conditions within the PPAP package.

2B.6 Special Characteristics

At a minimum, suppliers shall implement process controls for Special Characteristics as designated on TRW drawings. Additional characteristics deemed germane to be 'predictors of process stability and feedback' should also be identified in the supplier's Control Plan. These relate to product safety, government regulation, product performance, and the ability to assemble product and/or customer satisfaction features. These are identified by various symbols, requiring specific levels of special controls and process capability.

Unless otherwise specified by a product line and/or region for characteristics/features designated as significant or critical during launch, the supplier must calculate and report the **process capability as Ppk**. For those characteristics/features showing a Ppk of less than 1.67, the supplier must create an action plan that defines the containment and process improvements. Process capability can be conducted with both variable and attribute data. The minimum acceptable sample size for variable data is 100 pieces and for attribute, 300 pieces. Containment must effectively separate non-conforming material from the population. Containment, generally either 100% sort or some form of mistake proofing, must continue until such time that the process Cpk demonstrates capability greater than or equal to 1.33 unless otherwise specified by a product line designation.

Special focus will be given by TRW to evaluate the capability of all Significant & Critical characteristics and the validity of studies. In order to ensure this, capability reports must include a histogram, control charts and normality test. Please refer to the latest edition AIAG Manual on Statistical Process Control (SPC) and the PPAP Submission Checklist.

Product Line Specific Processes and Procedures

TRW Product Line	TRW Region	Document Name	Document Number	Description
Braking, Linkage & Suspension, Steering	Global	Designated Characteristics List	GSQM-100A	Defines special characteristics used on drawings.
	Brazil	Designated Characteristics (Identificação de Desenhos Informativo)	GSQM_100A-Brazil	
Electronics	North America	Designated Characteristics	GSQM-101	Designates symbols used in addition to WA.C45.001
Occupant Safety Systems	North America	Designated Characteristics Standard Procedure	WA.C45.001	Defines special characteristics used on drawings.
	Europe	Special Characteristics Implementation Procedure	GSQM-OSS 20.30G	Defines purpose and procedure for implementing special characteristics used on drawings.
		Special Characteristics Classification, Labeling of Characteristics	GSQM-OSS 20.30F	Special characteristics classifications and labeling.
Commercial Steering Systems	North America	Designated Characteristics Standard Procedure	CSS192239	Defines critical and significant characteristics used on drawings.

2B.7 Prototype Fabrication, Quality Evaluation, Pre-Production Process Changes

For the fabrication of prototype or pre-production parts, suppliers shall imitate the planned production process as closely as possible. For these prototypes, TRW may require that suppliers provide material, dimensional, performance, or process data. If the prototype and production suppliers are different, the prototype supplier shall share with the production supplier the process knowledge gathered in prototype fabrication. Proprietary information may be withheld by prior agreement with TRW.

The process established to produce parts for validation must not change without agreement and acceptance from TRW. These changes may include but are not limited to:

- Changes to outside or sub-tier suppliers
- Addition /deletion of capital equipment
- Addition / deletion of Tooling and/or gages
- Changes to manufacturing methodology
- Changes to internal secondary processing

Suppliers of prototype parts, when required, shall respond to material concerns.

Product Line Specific Processes and Procedures

TRW Product Line	TRW Region	Document Name	Document Number	Description
Occupant Safety Systems	Europe	Guideline to the Agreement for the Supply of Prototype Parts	L4_C20_F02_Rev01	Defines guidelines for logistical and quality requirements for the supply of prototype parts

2C. Serial Production Processes

2C.1 Introduction

Once the manufacturing process for producing a component is successfully validated, the serial production phase begins. During this stage, there are a number of requirements each supplier must be fully aware of and follow. Key areas include change management, concern management, sub-tier supplier management **and** annual revalidation. Additional expectations are also detailed in the following sections.

2C.2 Supplier Request for Change

Suppliers shall submit a written request to all TRW facilities affected by the proposed product or process change. In addition, suppliers shall ensure they receive an acknowledgement of receipt from TRW and obtain TRW approval prior to implementing the change. This includes changes at Sub-suppliers throughout the supply chain. Additionally, suppliers shall submit a written request for all items listed in Table 3.1 of the AIAG PPAP Manual. Suppliers are also required to submit all supporting validation data including necessary dimensional reports, capability studies, performance testing, before/after process parameters, updated APQP documentation (PFMEA/Control Plan) and a detailed timeline demonstrating proper change control that identifies necessary safety stock/bank requirements including timing for TRW/Customer validation timing and designated resources to manage the change.

TRW Launch window for new product introduction is defined as the period from supplier PPAP approval through TRW SOP plus 90 days. Changes submitted by suppliers during the Launch Window will be reviewed, however, will not be approved for implementation during the launch window. Please note: Some OEM specific requirements may extend the launch window beyond 90 days.

TRW must act in accordance with ALL customer requirements for change notification and as such, TRW expects the supply base to comply correspondingly. Change approval may take an extended period when TRW customer approval is required. The testing and/or customer qualification process begins when the supplier provides sample parts to meet the TRW Automotive validation plan. Changes **shall not** be implemented prior to the receipt of written approval from TRW. **VERBAL REQUESTS WILL NOT BE ACCEPTED.** Below are the defined notification requirements, similar to Table 3.1 of AIAG PPAP Manual, 4th edition.

See TRW Product Line Specific Processes and Procedures at the end of this section for further details and forms.

TRW Notification and submission requirements

Requirement	Clarification or Examples
1. Use of other construction or material than was used in the previously approved part or product	For example, other construction as documented on a deviation (permit) or included as a note on the design record and not covered by an approved engineering change and PPAP approval.
2. Production from new or modified tools (except perishable tools), dies, molds, patterns, etc including additional or replacement tooling	This requirement only applies to tools, which due to their unique form or functions can be expected to influence the integrity of the final product. It is NOT meant to describe standard tools (new or repaired), such as standard measuring devices, drivers, (manual or power), etc.
3. Production following refurbishment or rearrangement of existing tooling or equipment	<p>Refurbishment means the reconstruction and/or modification of a tool or machine or to increase the capacity, performance or change its existing function. This is NOT meant to be confused with normal maintenance, repair or replacement of parts, etc., for which no change in performance is to be expected and post repair verification methods have been established.</p> <p>Rearrangement is defined as activity which changes the sequence of product/process flow from that documented in the process flow diagram (including addition of a new process).</p> <p>Minor adjustments of production equipment may be required to meet safety requirements such as, installation of protective covers, elimination of potential ESD risks, etc. These changes can be made without TRW/Customer approval unless the process flow is changed as a result of this adjustment.</p>
4. Production from tooling and equipment transferred to a different plant location or from an additional plant location.	Production process tooling and/or equipment transferred between buildings or facilities in one or more locations.
5. Change of subcontractor for parts, non-equivalent materials, or services (e.g. Heat Treating, Plating, protective or functional coatings) that affect TRW or OEM fit, form, function, durability, or performance requirements.	<p>Suppliers to TRW are responsible for approval of subcontracted material and services that do not affect customer fit, form, function, durability, or performance requirements and demonstrate appropriate APQP and PPAP discipline!</p> <p>Suppliers ARE responsible to communicate and obtain approval for all tiers of supply chain within the manufacturing process!</p>

6. Product produced after the tooling has been inactive for volume production for twelve months or more.	For product that has been produced after tooling has been inactive for twelve months or more: Notification is required when the part has had no active purchase order and the existing tooling has been inactive for volume production for twelve months or more. The only exception is when the part has low volume, e.g. service or specialty vehicles. However, TRW or its customers may specify certain PPAP requirements for service parts.
7. Product and process changes related to components of the production product manufactured internally or manufactured by subcontractors that impact fit, form, function, performance, and/or durability of the salable product. Additionally, the supplier shall concur with any requests by a subcontractor before submission to TRW and its respective customer base.	Any change that affects TRW or its Customer requirements for fit, form, function, performance, and/or durability requires notification to TRW. Note: The fit, form, function, performance, and/or durability requirements should be part of TRW/Customer specifications as agreed on during contract review.
8. For bulk materials only: a. New source of raw material with special characteristics from new or existing subcontractor. b. Change in product appearance attributes where there is no appearance specification. c. Revised parameters in the same process (outside PFMEA parameters of the approved product, includes packaging). d. Change outside of DFMEA (product composition, ingredient levels) of the approved product.	These changes would normally be expected to have an effect on the performance of the product.
9. Change in test/inspection method – new technique (no effect on acceptance criteria)	For change in test method, supplier should have evidence that the new method provides results equivalent to the old (previous) method.

Figure 9. TRW Notification and Submission Requirements

Consequences of non-communicated or unauthorized process changes at the supplier manufacturing facility or any sub-supplier facility could result in any or all of following actions:

1. Written notification from TRW to the supplier's Registrar or from TRW to the supplier requesting they notify their registrar of the non-conformance,
2. Supplier Bid List status change to fix New Business Hold (NBH) for a period of 3 – 6 months, depending on root cause of non-conformance,
3. Issuance of Critical A concern and immediate third party containment (controlled shipment) of affected component/product,
4. Potential request for independent, third party audit of affected supply chain, including ALL affected sub-tier suppliers involved.

Reinstatement of supplier to 'Acceptable' status will depend on suppliers' ability to develop effective preventative actions and verification by TRW accordingly.

Authorization to ship production material shall be given after the change is communicated through a signed Part Submission Warrant, after TRW has approved the PPAP for the requested change and that change is coordinated through the using TRW facility or facilities.

Off-Line rework, not included in the original Control Plan, is considered a process change and suppliers shall obtain TRW approval for it as specified above. Rework shall be supported by operating and inspection instructions. The inspection instructions shall be consistent with an updated production process control plan. TRW will require special identification and segregation of the reworked product.

Suppliers shall request, in writing, a deviation (or concession) before shipping non-conforming material to TRW. A plan to return to normal production and the time required to do so shall be submitted at same time as the written request. Material shipped under an approved deviation shall be labeled with the Deviation Number and its expiration date. For an example, see Figure 10.



Figure 10. Example of a Deviation Label

Product Line Specific Processes and Procedures

TRW Product Line	TRW Region	Document Name	Document Number	Description
Body Control Systems	North America; Europe	Supplier Request for Change	QF0650-01	Form for requesting a Deviation, Drawing Change or Process Change
	North America	Life of Tool Deviation	C_065_4_005_EN	Life of Tool request and approval form
Braking	North America	Manufacturing/ Purchasing Change Request	GSQM-130	Describes methodology for requesting/changing a specification
Chassis	Global	Change Request Form (MPCR)	GSQM-130A	Change Request form
Electronics	Global	Supplier Request for Change	QF0650-01	Form for requesting a Deviation, Drawing Change or Process Change
		Supplier Request for Change - Attachments	FH.D20.001.F03	Attachments
		Supplier Request for Change - Checklist	FH.D20.001.F04	Checklist
		Supplier Request for Change – CPM	FH.D20.001.F05	Change Point Matrix

TRW Product Line	TRW Region	Document Name	Document Number	Description
Occupant Safety Systems	North America	Supplier Request for Change	QF0650-01	Form for requesting a Deviation, Drawing Change or Process Change
	Europe	Manufacturing/ Purchasing Change Request (MPCR) – Deviation Application	GSQM-OSS 30.20G	Defines purpose and procedure for suppliers to request a change/deviation from TRW
		Manufacturing/ Purchasing Change Request (MPCR) – Deviation form	GSQM-OSS 30.20F	Form for suppliers to request change/deviation from TRW.

2C.3 Concern Management

Upon receiving a TRW concern for quality, launch or delivery, suppliers shall implement a containment action within 24 hours. Within 10 working days, unless otherwise specified, the suppliers shall submit a corrective action plan or a reasonable approach to developing one in case of complex issues. These targets are standard, but the concern creator can establish other target dates, if needed. Suppliers shall use a systematic problem solving method such as 8D, 5 Phase, 7-Step, etc. Concern issuance, response and tracking are all online, and the suppliers shall participate in the TRW online system.

Concerns are raised at differing levels reflecting the severity of the issue. Upon receiving an A-Critical concern from TRW, unless otherwise specified, suppliers shall complete a detailed systemic review of the root cause, such as 3x5 Why. This analysis shall consider the 3 root causes of the issue, the technical root cause, the detection system root cause and the root cause of the quality system.

Suppliers shall immediately notify TRW upon discovery that they might have shipped nonconforming or suspect product to TRW. Notification shall go to the Quality Manager and the Materials Manager, or in their absence, the Operations Manager of the TRW facility. The suppliers shall notify all TRW facilities receiving the same or similar affected product.

Suppliers are responsible for all costs and expenses created by any defect on the material supplied and TRW will recover these costs from the responsible supplier.

The Concern Management Process involves five key processes:

1. Identification and definition of problem (**TRW**)
2. Reporting and notification process (**TRW**)
3. Containment response and corrective action (**Supplier**)
4. PPM defects and rate of occurrence (**TRW**)
5. Supplier Charge back for quality related expenses (**TRW**)

Each step lists required and recommended elements for each procedure. Unless otherwise noted, the procedures that follow will be used by TRW. Suppliers are obliged to use or develop their own systems that comply with TRW's materials rejection and corrective actions procedures.

1. Identification and Definition of Problem - TRW

- A. **Shall** contain sufficient information to ensure understanding by the supplier of the problem
- B. **Shall** contain sufficient information to ensure proper and quick containment by supplier and user plant (Information may include lot number, traceability or quantity)
- C. **Shall** have representative samples available for review and supplier evaluation
- D. **Shall** have defined severity and/or classification of problems (see section 2.D.2-Supplier Performance Reporting)
- E. **Shall** contain quantitative information to define the extent of the problem
- F. **Shall** have a method to distinguish "fit and function" (critical) issues from "nonfunctional" (nuisance) issues

2. Reporting and notification Process – TRW

- A. **Shall** include proper identification and definition of problem
- B. **Shall** use a Concern Tracking System (VIN CTS) for reporting and status tracking
- C. **Shall** have established time frame for reporting and notification
- D. **Shall** include initiator or contact person at the issuing plant
- E. **Shall** ensure supplier acknowledgment of receipt of notice or report (CTS automated process)
- F. **Shall** identify status of material and current disposition
- G. **Shall** request a return material authorization (RMA), if applicable
- H. Should identify status of material and current disposition
- I. Should include the request for return material authorization (RMA), if applicable

3. Response and Corrective Action - Supplier

- A. **Shall** have well-defined procedure for corrective action and response
- B. **Shall** have well-defined time frame for corrective action and response
- C. **Shall** have formal approval, closure and tracking process
- D. **Shall** utilize 8D Process or a similar problem-resolution procedure for documenting and verifying corrective action
- E. **Shall** utilize VIN CTS for tracking and maintaining corrective action and response
- F. **Shall** submit responses and corrective actions to the appropriate TRW facility on or before the response required date
- G. **Shall** define specific steps for disposition of material
- H. **Shall** have a process for rescinding invalid corrective action requests, which are not needed or were generated in error by TRW
- I. Should have method or process for rescinding invalid or incorrect corrective action requests where 8D or a similar problem resolution process is not needed or error was made by initiator.

4. PPM Defect and Rate of Occurrence – TRW

- A. TRW shall have a well-defined procedure to adjust PPM to verified parts defective.
- B. The supplier shall acknowledge receipt of returned parts within the time frame dictated by the using plant.
- C. The Supplier, within the time frame dictated by the using plant, as part of the 8D or a similar problem-resolution process, must supply to using plant a minimum of the following information:
 - i. Segregation/containment actions
 - ii. Sort results
 - iii. Rework plan
 - iv. Interim actions
 - v. Root causes
- D. PPM will include the following:
 - i. Quantity of VERIFIED nonconforming production parts
 - ii. Quantity reworked and used (on-site or off-site) without a prior authorized deviation and used
 - iii. Initial PPM will include total quantity of suspect parts returned to supplier. This amount will be adjusted later to reflect actual defect quantity if all adjustment policy criteria are met.
- E. PPM will not include the following:
 - i. Parts that have not been PPAP approved and/or prototypes
 - ii. Parts used under prior authorized deviation
 - iii. Warranty returns
 - iv. Parts “used as is” supplied on a “use as is” basis
- F. Bulk Rejections - Guidelines
 - i. Rules for Bulk rejections refer to the following product groups:
 - a. Raw materials (such as steel, aluminum, magnesium, plastic resin and brake fluid) and Consumables (such as; oils and lubricants).
 - b. In addition, the bulk rejection rules should be applied to components for the following reject categories; labeling (mis-labeling of a box/reel or a number of boxes in a lot) and contamination (contamination of a box or a number of boxes in a lot).
- G. Bulk Rejection Rules
 - i. First Occurrence – bulk rejection shall be counted as one (1) quantity nonconformance accompanied by a well-documented QCCAR.
 - ii. Second Occurrence – bulk reject Actual number of defects, not rejects, shall be included in the PPM calculation and supplier to be placed on Controlled Shipping Level I.
 - iii. Third Occurrence – bulk rejection, all parts shall be counted against the supplier, included in the PPM calculation, and supplier is placed on Controlled Shipping Level II.

5. Procedure for Supplier charge backs for Quality Related Expenses - TRW

- A. **Shall** have well-defined procedure capturing all associated costs for defective material and related expenses using TRW standard form
- B. **Shall** include detailed explanation of components for the charges, including hours, rework, cause and cost
- C. **Shall** be traceable to applicable CTS concern

- D. **Shall** have well-defined authorization and review levels and will be cross-functional including the following company disciplines: quality, purchasing, finance and plant management.
- E. **Shall** capture all associated costs.

2C.4 Supplier Audits

TRW Automotive employs a number of audit tools in its Supplier Development Process. This starts with the assessment of a potential new supplier who desires to enter into a business relationship with TRW to 2nd Party compliance audits to the latest version of ISO/TS 16949. See Figure 11.

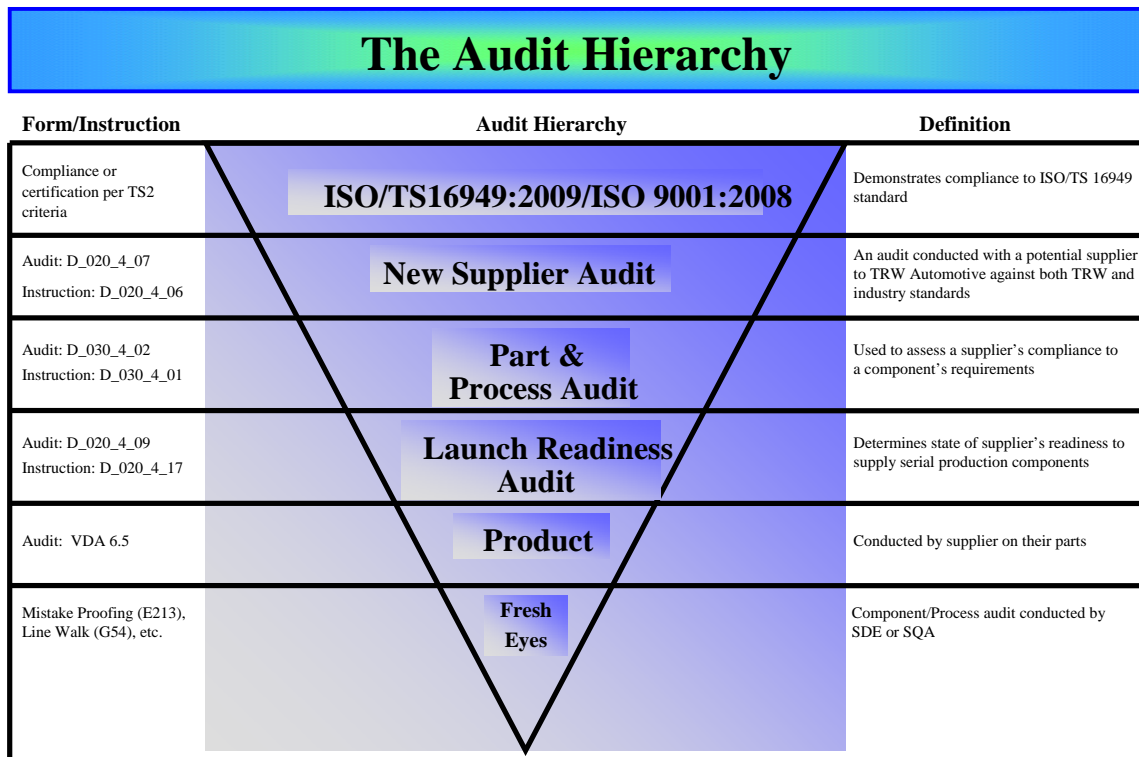


Figure 11. TRW Automotive Audit Hierarchy

Any supplier of production material to TRW will be requested to participate in one or more of the audit types defined in **Figure 11**. When notified of a scheduled audit, the supplier should conduct an internal audit prior to the arrival of the TRW audit team.

TRW may, at its discretion, utilize independent auditors. These individuals represent TRW Automotive and will audit the supplier's processes to establish conformance to validated quality systems.

TRW has a web-based audit tool, the Supplier Audit Database (SAD), located in VIN. This system hosts all audit related activities for all levels of audit. Suppliers will be notified, via email, of audit dates. Completed audits will be posted and accessible to all TRW facilities. Suppliers will submit corrective plans through SAD and will have closure of action items tracked through the system.

TRW Global Processes and Procedures

TRW Product Line	TRW Region	Document Name	Document Number	Description
Automotive	Global	New Supplier Audit	D_020_4_07	Audit to assess risks with potential new suppliers
		New Supplier Audit Protocol	D_020_4_06	New supplier audit instructions
		Launch Readiness Audit	D_020_4_09	Used during APQP
		Launch Readiness Audit Protocol	D_020_4_21	Launch Readiness Audit Instructions
		Part and Process Audit	D_030_4_02	Part and Process Audit
		Part and Process Audit Protocol	D_030_4_01	Part and Process Audit Protocol
		Product Audit	VDA 6.5	Product audit
		Line Walk	G_054_4_02	Line Walk Checklist

2C.5 Sub-Supplier Management

Suppliers to TRW Automotive shall have capabilities to manage their respective suppliers (regardless of how directed) including APQP disciplines and periodic auditing. TRW Automotive, when deemed necessary, will audit the critical processes of the sub-tier suppliers to assure that proper controls are in place throughout the entire supply stream. Suppliers to TRW shall ensure they audit and manage critical processes such as heat-treating and plating and, when directed, use the designated format. Special process audits are to follow AIAG's CQI-9 (Heat Treat), CQI-11 (Plating), CQI-12 (Coating), CQI-15 (Welding) and CQI-17 (Soldering) requirements.

Sub-tier suppliers have a tremendous impact on the quality of the final component. Whether they provide raw materials, services or sub-components their influence is so profound that it is critical for each of TRW's suppliers to have a supplier management system in place. This system shall include a function that tracks and reports the quality and delivery performance of their sub-tier supply base. Suppliers must be able to demonstrate effective management of sub-tier suppliers through documented, corrective actions and verification activities.

2C.6 Annual Revalidation

Unless otherwise specified, a complete annual layout inspection including all sub-components is required for all parts.

All suppliers shall annually revalidate their respective production components and be able to provide the results to TRW within 48 hours of a request. Revalidation submission requirements are product line specific criteria based on supplier performance and PPAP process flow. Suppliers shall compile revalidation plans and document this requirement in the Product Control Plan for all parts supplied regardless of the product line/region. Those features/characteristics/notes that will be part of the revalidation package need to be designated as such at the time of initial PPAP. TRW shall review and approve changes to the revalidation package content before any changes are made.

If the annual revalidation reveals nonconformance to TRW drawings, the supplier must immediately contact all TRW facilities receiving the affected part, and must supply the dimensional data and corrective action plans.

2C.7 Supplier Facility Access

By prior notice, suppliers shall allow TRW and TRW customers' access to both their facilities and their supplier's facility for the purpose of evaluating parts, processes, documents (i.e., FMEA, Control Plan, Instructions, records....), methodologies and systems used in the manufacturing of TRW products.

TRW may, at its discretion, use 3rd Party independent auditors. These individuals represent TRW Automotive and will audit the supplier's processes to establish conformance to validated quality systems.

2C.8 Contingency Plan

Suppliers shall develop a contingency plan for potential catastrophes which may disrupt product flow to TRW and advise TRW at the earliest in the event of an actual disaster. In an actual catastrophe, suppliers shall provide TRW access to TRW's tools and/or their replacements.

2C.9 Document and Product Sample Retention

Suppliers shall retain documents and product samples for the time the part is active (a part is active as long as it is being supplied to the customer for original or service applications) in production plus a minimum period of 15 years. Parts used on multiple programs may require an exceptionally long retention period.

The supplier shall retain a master sample from each cavity, die, and pattern for the length of time that the component/material is active plus one year. The master sample shall be identified as such and shall show PPAP submission reference and TRW approval date.

2C.10 TRW Property – Tools

All tools, manufacturing, test or inspection equipment belonging to TRW, or their customers, will be permanently marked to clearly show that they are Property of TRW (ISO/TS 16949-7.5.4.1), or the customer. These tools will only be used for TRW products unless an authorization in writing exists. Contact your Product Line buyer for information regarding this subject.

2D. Continuous Improvement

2D.1 Introduction

TRW Automotive defines supplier continuous improvement as a holistic approach to overall quality management system improvement. Suppliers should, at a minimum, during the Annual Purchasing Planning Process (APPP), develop and present plans which improve internal systems that support flawless launching of new products/components/sub-systems, value enhancements and cost competitiveness and achievement of agreed upon quality targets, along with a plan to achieve zero defects in support of on-going operational excellence. This plan should include lessons learned from previous launch, cost and quality issues, and how these lessons have been incorporated into respective continuous improvement processes. Suppliers should also be prepared to discuss their intent to maintain or achieve strategic status including a plan to 'grow' with TRW globally, if applicable. TRW recommends suppliers use the fundamentals outlined in ISO/TS 16949:2009 as a platform for organizing continuous improvement plans.

2D.2 Supplier Performance Reporting

Where provided, suppliers shall access their performance through the TRW Vendor Information Network (VIN) website at <https://vin.trw.com/>. It is the expectation of TRW that suppliers of purchased material will achieve and maintain zero defects and 100% On-time Delivery. TRW will update supplier performance monthly and provide suppliers access to their performance scorecard. The scorecard (Figure 12) represents the supplier's performance in quality, launch, delivery, warranty, environmental and commercial categories. The supplier's performance status is taken into consideration as part of future sourcing decisions as well as identifying areas to focus continuous improvement efforts.

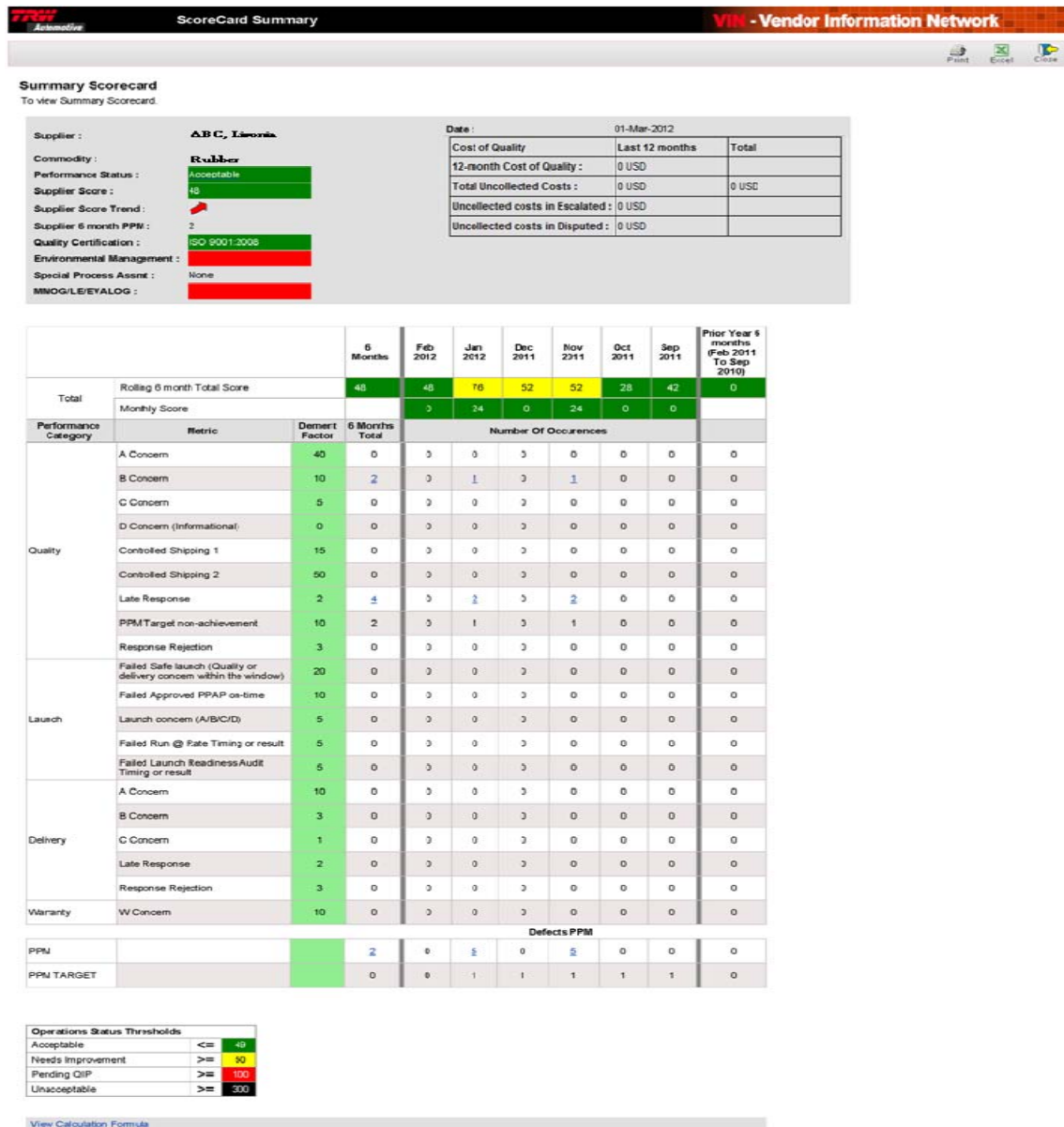


Figure 12. Example of a Supplier Performance Scorecard

Scorecard Definitions

<i>Performance Status</i>	This represents the supplier's overall performance in all categories for a 6 month period. The performance status is determined based on the Operations Status Threshold.
<i>Supplier Score</i>	The value of a supplier's performance based on the number of occurrences X the demerit factor for each category.
<i>Supplier Score Trend</i>	Displays if the supplier's performance is improving or trending down, getting worse or trending up or no change. The trend is based on the slope of the best-fit line applied to a 6-month rolling period.
<i>Supplier 6-Month PPM</i>	The number of defective parts is derived entirely from the concerns written in the Concern Tracking System (CTS) over 6 month period.
<i>Quality Certification</i>	Displays the current Quality Certification listed in the TRW VIN System. Suppliers are responsible for updating this information, and attaching a copy of the certification, whenever it changes. Suppliers can do this in the same area where they maintain their contact information.
<i>Environmental Management</i>	Displays if supplier ISO 14001 Certification is current in the TRW VIN System.
<i>Special Process Assessment</i>	Displays if supplier special process assessments i.e., CQI-9 are current in the TRW VIN System.
<i>MMOG LE/EVALOG</i>	An AIAG self assessment and continuous improvement tool for Materials Management. The Materials Management Operation Guidelines Logistics Evaluation (MMOG/LE) is required to be completed by suppliers on an annual basis.
<i>Quality</i>	<p><u>Concerns</u></p> <p>This is the count of concerns issued against rejected material by a TRW location. Concerns are ranked A, B, C, and D. An "A" concern is any component defect that</p> <ul style="list-style-type: none">○ Is raised by the customer.○ Causes TRW line downtime in excess of ten (10) minutes.○ Affects a defined critical or significant characteristic.<ul style="list-style-type: none">• A "B" concern is any component defect that does not conform to the drawing and cannot be used in production.• A "C" is any component defect that does not conform to the drawing and requires rework or a deviation to use in production.• A "D" concern is for informational purposes only. PPM is affected, but the Concern Score is not. <p><u>Controlled Shipping I & II (CS I & CSII)</u></p> <p>Number of incidents of controlled shipping.</p> <p><u>Late Responses</u></p> <p>Measures supplier responsiveness to A, B & C concerns.</p> <p><u>PPM Target Non-Achievement</u></p> <p>Displays if supplier is above PPM Target for a given month during a 6 month period.</p> <p><u>Response Rejection</u></p> <p>Measures when supplier Containment or Completion action is rejected.</p>

Launch

Failed Safe Launch

Quality or Delivery Concern (A,B,C) issued during the program launch period plus 90 days post start of production.

Failed Approved PPAP On Time

Measures if PPAP is approved after Approval Required due date as a result of supplier issues.

Launch Concern

Launch concern (A,B,C) issued during launch period and prior to SOP.

Failed Run @ Rate Timing or Result

Measures if supplier Run @ Rate is completed after due date and does not have passing score due to supplier issues.

Failed Launch Readiness Audit Timing or Result

Measures if supplier Launch Audit is completed after due date and does not have passing score due to supplier issues.

Delivery

Concerns

Operations will generate Delivery Concerns against incorrect delivery conditions. A concern is immediately communicated to suppliers via email and corrective action reports may be requested.

- ‘A’ Concerns: Most Critical Concerns. Any variances for release-based delivery: early delivery, late delivery, over-delivery, and under-delivery.
- ‘B’ Concerns: Somewhat Critical Concerns. Caused significant scheduling changes within TRW; Chronic severe premium freight issues; Chronic failure to communicate appropriately.
- ‘C’ Concerns: Informational Concerns such as incorrectly located labels. Recurring C concerns can be escalated to a B concern by the plant at their discretion.

Late Response

Measures supplier responsiveness to A & B concerns.

Response Rejection

Measures when supplier Containment or Completion action is rejected.

Warranty Concern

A “W” concern is used to document warranty related issues.

PPM

The method by which the supplier’s PPM is calculated using the following formula:

$$\text{PPM} = (\text{No. of Defective Parts} \div \text{Total number of parts received}) \times 1,000,000$$

PPM Targets

Performance targets are established for all suppliers annually. The VIN system will automatically generate the next year’s targets based on a 50% improvement to the current performance using data from July of the previous year through June of the current year. In support of the Advanced Purchasing Procurement Process (APPP), these goals are then re-evaluated by Purchasing and Supplier Quality using QOS analysis and may be adjusted to assure the proper targets are set.

Prior Year 6 Months

The supplier performance status for 6 month period corresponding to the prior calendar year

Note: Regions/suppliers not linked to the VIN system should contact your Purchasing representative regarding this topic.

2D.3 Intensive Improvement Process

The Intensive Improvement process involves four steps (**Figure 13**). It starts with one of the TRW facilities writing a complaint against a supplier for a quality performance issue. The corrective action process can escalate from a written corrective action to certified stock or controlled shipping; to one of the intensive improvement disciplines.

There are two levels which make up the Intensive Improvement process. The first level is the Supplier Quality Improvement Process (SQIP) which is managed at the plant level. Suppliers who qualify for this program will be formally notified. It is expected that suppliers placed on SQIP will commit the necessary resources to graduate by the established target date. Those suppliers who do not graduate from SQIP are eligible for nomination into the Top Focus process which is second level. TRW's Commodity Management team is responsible for managing the Top Focus process. The consequence of failing to graduate from Top Focus may permanently affect the relationship between TRW and the supplier.

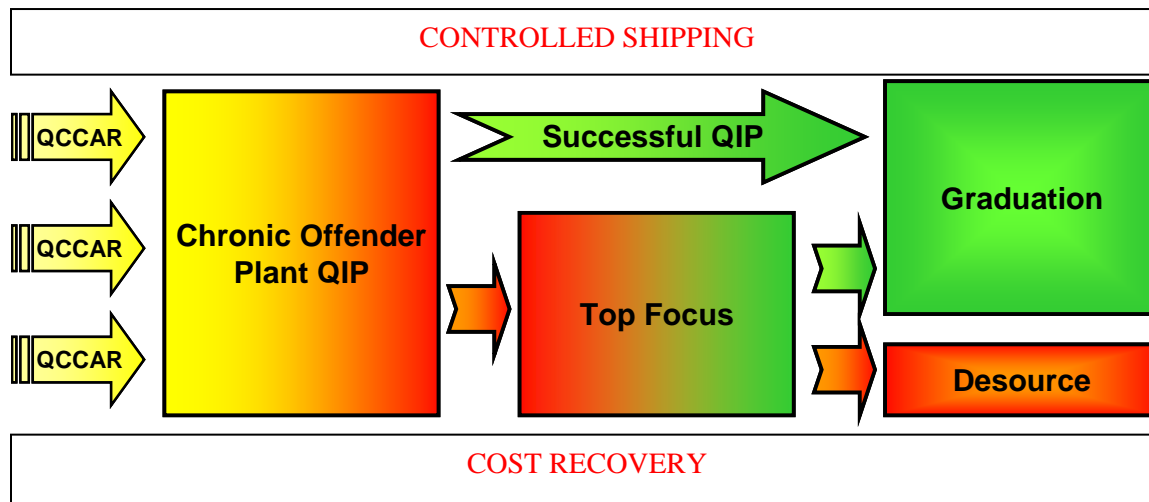


Figure 13. Intensive Improvement Process

2D.4 Controlled Shipping

Controlled Shipping (CS) Level I and II will be levied against the supplier when the TRW Automotive plant has determined that the supplier does not have the necessary safeguards preventing non-conforming products from reaching TRW manufacturing location or its customers.

Controlled Shipping, Level I (CS I) is initiated by TRW and performed at the supplier location by supplier employees. Controlled Shipping Inspection process must be performed in a controlled area of the plant. Secondary Inspection data must be collected and inspected product must be certified and data is to be provided to the TRW receiving plant.

Controlled Shipping, Level II (CS II) includes all of Level I, with an added inspection by a TRW approved 3rd party. Third party is selected by the supplier and approved by TRW and paid by the Supplier. In some instances, TRW may require that the 3rd party inspection to be performed outside the supplier facility. In all cases the Quality Certification body of the Supplier must be informed by the supplier that they have been placed upon Controlled Shipping Level II by their customer and confirmation that this action has been completed must be provided to the TRW receiving plant within 5 days.

Based on the severity of the incident, TRW may elect to go directly to CSII. TRW SQA will review irreversible corrective action and authorize removal or renewal of Controlled Shipping when appropriate. **NOTE: Minimum Record of 30 days Corrective Action verification period with no re-occurrences is mandatory.**

2D.5 Cost Recovery

Supplier Cost Recovery (CR) will be initiated by TRW Automotive when it has been determined that the supplier is responsible for shortcomings in quality, delivery, etc. Cost Recovery will be communicated using Vendor Information Network. Cost Recovery process will include, but is not limited to contaminated stock at a TRWA plant, product in transit, OEM assembly plant, non-conforming received goods, assembly line downtime due to delivery or quality related issues, warranty returns, and costs required to analyze and rectify the affects of a quality, warranty, launch or delivery issue that result in a concern being raised. Inspection costs, analysis costs, rectification costs, transit costs and costs to manage the implementation of a non-reversible corrective action may also be included. Level of cost recovery against concerns will be a significant factor in TRW Automotive sourcing decisions.

2D.6 Supplier Warranty Cost Recovery

TRW Warranty costs resulting from supplier non-conformances or failure to follow established and approved processes will be recovered through the Cost Recovery process outlined in 2D.5. For these issues, Warranty Concerns will be raised in VIN and Warranty Cost of Quality will be inclusive of all TRW incurred expenses including charges from TRW customers.

Glossary

Term	Definition
APQP	Advanced Product Quality Planning. A structure activity which plans, tracks and reports the development of a process to manufacture a component/material/assembly to meet customer requirements.
AIAG	Automotive Industry Action Group. A North American automotive organization, which publishes standards.
ASN	Advance Shipping Notice
Cpk	The capability index for a stable process.
CR	Cost Recovery.
CS	Controlled Shipping.
CTS	Concern Tracking System. An internet based material rejection reporting system used by TRW Automotive to notify their supply base of non-conforming material/components affecting a TRW facility.
DCTS	Delivery Concern Tracking System. An internet based delivery performance reporting system used by TRW Automotive to notify their supply base of non-conforming material/components affecting a TRW facility.
DFMEA	Design Failure Modes Effect Analysis. A document generated during the design phase that identifies and establishes controls for potential failures in a component/material/assembly.
DLN	Dual Launch Netting. Joint product assurance activity between TRW and supplier(s).
DV	Design Validation. Testing that assures that a component/ material/ assembly meets the users' requirements.
GDPIM (Global Development and Product Introduction Management)	GDPIM is the business process used to manage product development and customer application programs. The process consists of defined phases and reviews that cover the product development cycle from concept to production. The process employs cross-functional program management and a defined set of tools & techniques and Measures of Performance (MOPs) for executing and monitoring the programs. A key element is the use of cross-functional teams in both the core and customer application development programs.
EDI	Electronic Data Interchange

ELV/IMDS	End-of-Vehicle-Life/International Materials Data System. ELV is a regulatory requirement to eliminate hazardous materials from current production components. IMDS is the data system used to collect and report on the materials that make up components and assemblies.
LRA	Launch Readiness Audit. An audit conducted one or more times throughout the APQP process to determine a supplier's state of readiness to start serial production.
MOPS	Measure of Performance Systems. The TRW Automotive system that collects and reports supplier quality and delivery performance data.
MPCR	Manufacturing/Purchasing Changes Request. A form only used by TRW Braking in North America for suppliers to request changes from that product line and region.
OEM	Original Equipment Manufacturer. Applies to automotive corporations, i.e., BMW, Ford, Daimler-Chrysler, GM, Volkswagen, etc.
PFMEA	Process Failure Modes Effects Analysis. A team process that identifies and controls potential failures before the product goes into production.
PPAP	Production Part Approval Process. A defined process for the validation of new materials and subsequent process changes.
Ppk	The performance index of a process. Normally used as part of the PPAP process.
PTS	Program Tracking System. An internet based launch tracking system used by TRW Automotive to monitor and report on component status' affecting new program launches. Suppliers will be able to report progress toward key milestones affecting their APQP deliverables.
PV	Production Validation. Testing that assures that the manufacturing process produces product that meets the customers requirements.
QIP	Quality Improvement Plan. A supplier intensive improvement tool used by SQA.
SAD	Supplier Audit Database. An Internet application the stores supplier audits and tracks closure of identified issues.
Shall	Use of the word "shall" indicates mandatory requirements.
Should	Use of the word "should" indicates recommended requirements.
SLP	Safe Launch Plan. A supplier's plan to provide increased assurance for products covered by Dual Launch Netting (DLN).
SDE	Supplier Development Engineer. A quality engineer who is primarily responsible for APQP activity and development of a supplier's systems.

SQA	Supplier Quality Assurance. A quality engineer who is primarily responsible for suppliers' quality after the start of production.
TF	Top Focus. A supplier intensive improvement tool used by SDE.
TRWA	TRW Automotive
VIN	Vendor Information Network. Suite of applications that includes MOPs, SAD and supplier contact information.