General Motors Corporation

Global Supplier Quality Manual

Global Purchasing and Supply Chain

September 2008 GM 1927

Preface

This Reference Manual represents the collaborative efforts of multiple GM worldwide teams engaged to develop a GM Common process manual that includes APQP, Launch, and Current Quality. Prior to this, multiple documents existed to define a Supplier Quality process from APQP through Current Quality.

APQP
The APQP portion of this manual defines GM's common global product quality planning requirements that are necessary to develop and implement an APQP process for a product or service. It is intended as a standard to provide the Supplier Quality Engineer, and the supplier, a common format from which to proceed with all steps of APQP.

Launch
The Launch portion of this manual defines standardized processes that support specific supplier launch readiness activities and APQP deliverables. These globally approved activities are designed to assist in the assessment of launch readiness of all suppliers and ensure execution of flawless launches.

Current
The Current portion of this manual defines the standardized work around common processes used globally to protect our manufacturing/assembly plants and to drive systemic improvement to the supply base.

Approved by:

Global Supplier Quality Directors

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Section 3 – Global Current

Current Task Definitions

Manual Content Explanation

This manual contains three (3) sections. Each section has tasks that are referenced by a task number and includes the following:

- Task name
- Task Owner(s)
- Task Timing (approximate)
- Task Description
- Deliverables upon completion of the specific task
- Customer(s) for the deliverables
- Necessary Inputs to complete the specific task including source for each input
- Listing of Resources—this includes people of organizations involved in completing the task
- Methodology—brief description of the task and purpose
- SQE Responsibilities—brief description of actions required
- Supplier Responsibilities—brief description of actions required
- References and additional information

Document Procurement

Forms
GM forms and documents referenced in this manual GM 1927 can be obtained through GM SupplyPower at www.gmsupplypower.com and be copied for use.

GM General Procedures (GPs)
General Procedures (GPs) referenced can be obtained through GM SupplyPower at www.gmsupplypower.com and be copied for use.

Labels & Tags
Labels and tags referenced in the APQP process can be obtained as follows:

GMAP and GME – contact the SQE
GMLAAM – Labels and tags can be obtained from any supplier as long as it meets standards identified in the General Procedures
GMNA – Contact CMS Print Solutions 1-734-953-3266, extension 211, Fax 1-734-953-3265

AIAG Documents
All AIAG specific documents referenced can be obtained by contacting AIAG at 01-248-358-3003. Documents can also be ordered by accessing the web at www.AIAG.org. In Europe contact *Carwin Ltd* at 44-1708-861333.

Note to Suppliers:
This manual is intended to be comprehensive and "all-encompassing"; however, certain circumstances will prompt questions. If you have any questions regarding any part of this manual you are encouraged to contact your respective Supplier Quality Engineer.

Section 1

Global APQP

Customer vs. Supplier Monitored APQP

The following matrix describes the responsibility differences between "Customer-Monitored" and "Supplier-Monitored" APQP. Suppliers are responsible for carrying out all the "R" activities shown in the supplier column of the matrix, whether or not their parts are designated as customer or supplier-monitored APQP. If a part is designated as customer-monitored APQP, a GM representative will monitor and approve the APQP activities.

	APQP Activity	Customer Monitored APQP		Supplier Monitored APQP	
		Supplier	GM	Supplier	GM
1	Commodity Key Stakeholders Meeting.	N/A	R	N/A	R
2	Technical Reviews	S	R	S	R
3	Sourcing Eligibility	N/A	R	N/A	R
4	Gate Review #1 (Kick-Off Meeting) Remaining Gate Reviews	S R	R A	S R	R I
5	Timing Charts/Open Issues	R	A	R	I
6	QSB	R	A	R	A
7	Flow Chart	R	I	R	I
8	DFMEA (1 – Supplier Design Responsible, 2 – GM Design Responsible)	R (1) S (2)	A	R S	I
9	Design Review (1 – Supplier Design Responsible, 2 – GM Design Responsible)	R (1) S (2)	S (1) R (2)	R (1) S (2)	I
10	Tool and Equipment Review	R	A	R	I
11	Gage Review & Approval	R	A	R	A
12	PFMEA	R	I	R	I
13	Control Plan	R	I	R	I
14	GP-12	R	I	R	I
15	PPAP	R	A	R	A
16	Run @ Rate (GP-9)	R	A	R	I
17	Lessons Learned	R	I	R	I

R *Responsible* - Task Owner (GM or Supplier)
A *Approve* - Approve deliverables (GM)
S *Support* – Support Completion of deliverables (GM or Supplier)
I *Inform* - Review deliverables at discretion of SQE (GM)
N/A Not Applicable

Document Usage Guidelines

F = Reference Only (information only, nothing to fill out)
MD = Mandatory Document (specific format required)
MI = Mandatory Information (format may vary, content mandatory)
RD = Recommended Document (not mandated, at a minimum content should be reviewed)

Document	Number	Mandatory (Upload to GQTS)	Mandatory	Recommended
APQP Project Plan	GM1927-01		F	
APQP Timing Chart	GM1927-02	MI		
Supplier Quality Statement of Requirements (SOR)	GM1927-03		MD	
APQP Open Issues	GM1927-05		MI	
Commodity Key Stakeholders Meeting Checklist	GM1927-06			RD
APQP Supplier Assessment	GM1927-07		MD	
Technical Review Checklist	GM1927-13			RD
APQP Kick-Off Meeting Checklist	GM1927-14	MD		
Process Control Plan Audit Worksheet	GM1927-16	MD		
GM and Supplier Program Contacts	GM1927-17		MI	
Process Capability Over Time	GM1927-20			RD
RPN Reduction Summary Chart	GM1927-21	MD		
Directed Buy/Directed Source Checklist	GM1927-23		MD	
Subcontractor Program Status Matrix	GM1927-25	MD		
Subcontractor Detailed Status Matrix	GM1927-26		MI	
Global Gage Request	GM1927-29		MD	
QSB Audit	GM1927-30	MD		
Greenfield & Brownfield Development Assessment Process	GM1927-31	MD		
Dimensional Results	GM1927-32	MD		
GP12 Audit	GM1927-33	MD		
APQP Supplier Status Workbook	GM1927-34	MD		
Run @ Rate Capacity Workbook	GM1927-35	MD		
QSB Presentation	GM1927-36		F	

Obsolete Documents: GM1927-4, GM 1927-8, GM 1927-9, GM1927-10, GM 1927-11, GM 1927-12, GM 1927-15, GM1927-18, GM1927-19, GM1927-22M, GM1927-27, GM 1927-24M, GM1927-28

Advanced Product Quality Planning (APQP)
Global Process

1

Task Number: **1**

Task Name: **Commodity Key Stakeholders Meeting (CKSM)**

Task Owner: Buyer

Task Timing: Pre-Sourcing

Task Description: Introduce and establish Key Stakeholder ownership, identify program-specific strategies in the Engineering & Advance Purchasing Sourcing Process (E&APSP) and ensure that the RFQ-package contains all information needed to receive comparable quotes.

Key Deliverables:
- SQ approval of the RFQ package content, timing and preliminary Bid List

Customer for Deliverables: Purchasing, Engineering, Supplier Quality and Marketing, PC&L as required

Necessary Inputs:	**Source of Input:**
• Technical documents (BOM, SOR, SSTS/CTS etc.)	Engineer
• A/D/V Process Tasks and Deliverables	Engineer
• Creativity Team Bidders List (enhanced quality metrics)	Buyer
• Proposed Sourcing Strategy	Buyer
• Part-Specific Quality & Process SOR	SQE
• Lessons Learned (including warranty items) on previous programs	Buyer/SQE/Engineer
• Program related information	Key Stakeholders

Resources: Purchasing, Supplier Quality, Engineering

Responsible	**Methodology :**
Buyer	Invite appropriate Key Stakeholders identified for specific component/commodity/system and conduct the meeting as stated on typical Engineering & Advance Purchasing Sourcing process (E&APSP) agenda (this meeting is to be conducted on all parts listed in the sourcing plan at the time stated in the sourcing plan).
Buyer	Clarify the timing of each step in the AP Sourcing process, what is expected from each Stakeholder and get agreement on the process, content, timing and strategy for the sourcing package.
Buyer	Propose roles and responsibilities for any directed buy part that will not follow the default conditions established by GM1927-3 and GM 1927-23 (to be added to the RFQ if applicable).
Buyer	Establish timing and lead question development for Supplier Workshops (Technology, Cost Reduction or Problem Resolution). Define a core group (sub-group of Stakeholders) to attend Supplier Workshops, summarize results and refine functional requirements based on workshop findings (if applicable).
Buyer	Apply E&APSP CKSM & SOR checklists as appropriate.
Buyer	Start Open Issues list with any items that need to be addressed.
DRE	Present SOR content & allowable cost status and clarify what is being sourced (technological, dimensional, functional and test requirements).
DRE	Present Warranty Data – i.e. **Incidents per Thousand Vehicles** (IPTV), **Cost per Vehicle** (CPV) and engineering benchmark data (consult warranty champion if necessary).
SQE	Review potential bidders list proposed by Buyer to restrict Request for Quotation (RFQ) distribution to suppliers that meet GM criteria. Identify suppliers that will require Quality Business Case action plans as established by GM Global APQP task #3 and start planning any required audits.
SQE	Review the requirements stated in the SQ SOR GM1927-3, and the Part-Specific Quality & Process SOR (if applicable) to ensure that they are be included in the Request For Quotation package.
SQE	Provide an overview of commodity specific Lessons Learned from previous programs.
SQE	Inquire about any sequencing plans.
SQE	Apply the Commodity Key Stakeholders Meeting Checklist GM1927-6 as appropriate.

Reference Documents:
- Supplier Quality Statement of Requirements GM1927-3 / Part-Specific Quality & Process SOR
- Open Issues list GM1927-5
- Commodity Key Stakeholders Meeting Checklist GM1927-6
- E&APSP : Commodity Key Stakeholders Invitees / Key Stakeholders Checklist / SOR Checklist

Advanced Product Quality Planning (APQP)
Global Process

2

Task Number: **2**

Task Name: **Technical Review**

Task Owner: Buyer

Task Timing: Pre-Sourcing

Task Description: Review the supplier technical proposal to ensure that all requirements in the RFQ-package have been understood and supplier has a plan to produce parts meeting GM expectations.

Key Deliverables:
- Identification of suppliers that are capable
- Completed APQP Supplier Assessment GM1927-7

Customer for Deliverables: Buyer, SQE, Engineer, Manufacturing Engineer

Necessary Inputs:	**Source of Input:**
• Technical documents	Engineer
• Supplier's Quality History	SQE
• List of Directed Buys	Buyer
• Carryover part contact list	Buyer
• Required Quality Information as per GM1927-3 item #12	Supplier

Resources: Purchasing, Engineering, Supplier Quality, Manufacturing Engineer, Supplier

Responsible	Methodology :
Buyer	Invite potential suppliers to Technical Review Meetings.
Buyer	Update the Open Issues List with concerns related to the supplier's ability to meet the requirements.
DRE	Identify specific agenda items for Suppliers to cover in Technical Review.
DRE	Assess Supplier technical capability for continuation in the sourcing process.
SQE	At the conclusion of the Technical Review, the Buyer, SQE and Engineer complete the APQP Supplier Assessment GM1927-7 (this is required prior to signing the Sourcing Recommendation form).
SQE	Prior to the meeting, review specific documents provided in the supplier's quote package as per SQ SOR GM1927-3 and prepare questions related to quality and manufacturability in order to assess supplier capability and to support SQ recommendation about supplier continuation in the sourcing process.
SQE	Ensure Supplier understands the SQ SOR GM1927-3, and Part-Specific Quality & Process SOR (if applicable) and returns them properly signed.
SQE	Provide a brief overview of the Lessons Learned process.
SQE	Complete the Technical Review Checklist GM1927-13 (recommended).
Supplier	Review information as requested by "Required Quality Information" item in the SQ SOR GM1927-3: Preliminary timing charts: • Highlight concerns relative to tooling, gages or testing that may impact PPAP • Revisions to manufacturing facility, including Greenfield or Brownfield plans • Manpower resource commitment to ensure successful completion of program; proper skills and training to perform the necessary tasks. Preliminary process flow diagrams, PFMEA and Control Plan: • Highlight any special assembly techniques, test methods or containment procedures used. Capability studies on similar parts : • Confirm error proofing, data analysis, and record keeping is included and review plan to meet any GM warranty targets (review existing open PRR and warranty sufficiency/action plans, data on similar products and plans for future reductions). Tiered supplier management: • Present process and resource plan for evaluation and management of tiered suppliers.
Supplier	Provide evidence of prior product experience or technical expertise relevant to new product.

Reference Documents:
- Supplier Quality Statement of Requirements GM1927-3 / Part-Specific Quality & Process SOR / APQP Open Issues List GM1927-5 / APQP Supplier Assessment GM1927-7 / Tech Review Checklist GM1927-13
- E&APSP : Tech Review Example Agenda / Tech Review Checklist

Advanced Product Quality Planning (APQP)
Global Process

3

Task Number: **3**

Task Name: **Sourcing Eligibility**

Task Owner: SQE

Task Timing: Pre-sourcing

Task Description: For a supplier location to be eligible to receive a new business award from GM the manufacturing location to be sourced must either be:

- Green on the GM Creativity Team Bid List (CTBL) for Quality for the specific commodity, OR
- Have a supporting Quality Business Case (QBC) QUAD report approved according to the criteria outlined in this task.

Key Deliverables:

- SQ Signed GPS recommendation sheet or equivalent and appropriate back-up documentation – either a copy of the latest CTBL report OR an approved QBC QUAD report with supporting audit approval

Customer for Deliverables: Purchasing

Necessary Inputs:	**Source of Input:**
• Bidding DUNs number / Supplier manufacturing location list	Buyer
• Minimum information by location:	
◦ Supplier name, address and DUNs number (if available)	Buyer
◦ Greenfield/Brownfield Y/N,	Buyer/SQE
◦ Existing TS-16949 certification Y/N,	Buyer/SQE
◦ Location currently ships specific commodity to GM Y/N	Buyer/SQE
• Assessment required completion date	Buyer
• Supplier contact details by location	Buyer
• Current CTBL report Quality status (R/G/NR)	Buyer/SQE

Resources: Purchasing, Supplier Quality and Supplier.

Responsible	**Methodology :**
Buyer	Provide final supplier location inputs, required to determine audit requirements, a minimum of 2 weeks prior to nomination date (information should be provided pre-Technical Review where feasible).
SQE	Based on the input information provided, using the table below, determine any audit required prior to sourcing for each supplier location in order to assess sourcing eligibility: • Where supplier location has TS-16949 certification the minimum audit requirement is PCPA, otherwise PSA audit should be applied.
SQE	Work jointly with the Sourcing Team to identify any DUNs numbers not Green for Quality on the CTBL at time of nomination and plan audits / QBC QUAD report follow-up accordingly.
SQE	Work with the Regional SQE (if different) to ensure audit scheduling and completion ahead of nomination date as required.
SQE	Work with the Regional SQE (if different) to ensure signed QBC QUAD report is provided ahead of the nomination date as required.
SQE	Communicate regularly with Buyer to comprehend any supplier location changes and, in particular, communicate any rejections / non-sourceable supplier locations as early as possible for escalation to CT.
SQE	Ensure completion of required audits in time for nomination and provide signed QBC QUAD report to Buyer where necessary ahead of sourcing table.
SQE	For a new supplier location sourcing: In QBC QUAD report, capture all open action items and plans for correction/mitigation and obtain SQ approval (from region where the supplier is located) to support the sourcing recommendation.
SQE	Sign sourcing recommendation for selected supplier.
Supplier	Provide necessary information as required and support audit requests at short notice.

Task Number: **3** continued

Task Name: **Sourcing Eligibility**

Sourcing Approval Matrix:

Supplier Location Type	CTBL Quality Rating	TS16949 Quality Standard Certified?	Required Audit	Comments
Greenfield (New Construction) OR Brownfield (Existing Building)	N/A	No, but Sister Facility Yes.	PCPA on Sister Facility Building Like Product.	Company Performance Data from Other Customers or Internal Data. QBC from Regional SQ Required. Buyer Must Request Duns be Loaded into CSIDS when Available.
Greenfield (New Construction) OR Brownfield (Existing Building)	N/A	No, and Sister Facility No.	PSA on Sister Facility Building Like Product.	Company Performance Data from Other Customers or Internal Data. QBC from Regional SQ Required. Buyer Must Request Duns be Loaded into CSIDS when Available.
Current Supplier to GM	Green	Yes	None	SQ signature / approval required on GPS Recommendation Sheet or Equivalent.
Current Supplier to GM	Red	Yes	None	Location cannot be sourced. Refer to SQ Regional Director.
Current Supplier To GM New CT Different Product	Green	Yes	PCPA	Acceptable PCPA, QBC (Quad Report) from Regional SQ Required. SQ signature / approval required on GPS Recommendation Sheet or Equivalent.
Current Supplier to GM New CT Different Product	Red	Yes	None	Location cannot be sourced. Refer to SQ Regional Director.
Current Supplier to GM New CT Different Product	NR	Yes	PCPA	Acceptable PCPA. Need Company Performance Data from Other Customers or Internal Data. QBC from Regional SQ Required. SQ signature / approval required on GPS Recommendation Sheet or Equivalent.
New to GM, no business with any GM locations	NR	Yes	PCPA	Need Company Performance Data from other Customers or Supplier Internal Data. QBC from Regional SQ Required.
New to GM, no business with any GM locations	NR	No	PSA	Need Company Performance Data from other Customers or Supplier Internal Data. QBC from Regional SQ Required.
New DUNS #, other Duns currently ship to GM	NR	Yes	PCPA	Review data from other Duns locations. QBC from Regional SQ Required.
New DUNS #, other Duns currently ship to GM	NR	No	PSA	Review data from other Duns locations. QBC from Regional SQ Required.
Not on CT Bidlist. Currently Shipping to location that is not using GQTS.	N/A	Yes	None	Current Local Bidlist Showing Green on Quality Metrics or Local SQ Approval. – Only Valid for Additional Business to Current GM Customer Location.
Not on CT Bidlist. Currently Shipping to location that is not using GQTS.	N/A	Yes	PCPA	Current Local Bidlist Showing Green on Quality Metrics. QBC from Regional SQ Required. – Only Valid for Additional Business to New GM Location.
Not on CT Bidlist. Currently Shipping to location that is not using GQTS.	N/A	No	PSA	Current Local Bidlist Showing Green on Quality Metrics. QBC from Regional SQ Required. – Only Valid for Additional Business to New GM Location.
No Duns Number	N/A	Yes	PCPA	Apply to Dun and Bradstreet for Duns Number. Follow Quality, Audit and Bidlist Requirements Previously Stated Depending on Supplier Situation. Buyer Must Request Duns be Loaded into CSIDS when Available. QBC from Regional SQ Required.
No Duns Number	N/A	No	PSA	Apply to Dun and Bradstreet for Duns Number. Follow Quality, Audit and Bidlist Requirements Previously Stated Depending on Supplier Situation. Buyer Must Request Duns be Loaded into CSIDS when Available. QBC from Regional SQ Required.

Reference Documents:

- QUAD report form GM1927-71
- PSA audit
- PCPA GM1927-16

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Task Number: 4

4

Task Name: **Gate Reviews**

Task Owner: SQE for Kick-off Meeting, Supplier for remaining meetings

Task Timing: As shown on APQP Project Plan

Task Description: The purpose of the Gate Reviews is to review the progress of all APQP Tasks as stated on the APQP Project Plan GM1927-1 and track the status and progress of items listed on the APQP Timing Chart GM1927-2. These review meetings are intended as an APQP team review of the part and process development and to capture the lessons learned from each build event. The Gate Review #1 (Kick-Off Meeting) is coordinated by the GM SQE for all APQP parts.

Key Deliverables:

- The Key Deliverable documents (see chart) are to be uploaded into GQTS. All other APQP documents and forms (referenced in the GM Global APQP Supplier Status Summary Workbook GM1927-34) are to be retained at the supplier location.
- The Key Deliverables related to PPAP (e.g. GM1411, Dimensional Report, GM3660), must contain the GQTS PPAP activity code as reference.

Gate Deadline (Time from SORP in weeks)	GVDP 5.0 timing reference	Review	Key Deliverables	Form/ Document
		ALL	GM Global APQP Supplier Status Summary Workbook	GM1927-34
	Within 30 days of business nomination advice / contract	Gate 1	QSB Audit (Gap Analysis) or Greenfield Checklist (Action Plan)	GM1927-30 GM1927-31
			Timing Plan	GM1927-2
			Kick-Off Check list	GM1927-14
-78	Initiated after CVER and completed 5 weeks after IVER	Gate 2	PFMEA Check list	AIAG A-7
			RPN Reduction Summary	GM1927-21
			Subcontractor Status	GM1927-25
-52	Completed 10 weeks prior Matching 1 GA	Gate 3	Validation Plan (A/D/V P&R)	GM1829
			QSB Audit (Compliance) or Greenfield Checklist (Complete)	GM1927-30 GM1927-31
			Run @ Rate Capacity Workbook	GM1927-35
-35	Completed 3 weeks prior PPV MRD	Gate 4	Dimensional Report	GM1927-32
			PPAP Worksheet (if not fully approved)	GM1411
			GP12 Audit	GM1927-33
-15	Completed 1 week prior MVBs MRD	PPAP	PPAP Approval	
-8		Run @ Rate	Run @ Rate Execution	R@R Module
			PCPA	GM1927-16

Customer for Deliverables: SQE, Buyer, Engineer, Readiness Coordinator, Manufacturing as appropriate.

Necessary Inputs:	**Source of Input:**
• Program timing for key events	Engineer/Buyer
• Detailed program timing	Supplier
• APQP Open Issues List GM1927-5	Supplier/SQE
• APQP Timing Chart GM1927-2	Supplier/SQE

Resources: Buyer, DRE, SVE, SQE, Readiness Coordinator, Manufacturing Engineer

Task Number: **4** continued

Task Name: **Gate Reviews**

Responsible	Methodology:
SQE	Two Kick-Off meetings could potentially occur. One for Purchasing scheduled by the Buyer (It is optional in the AP process) and one for Supplier Quality scheduled by the SQE. It is desirable that the two meetings be combined into one. If the Buyer conducts a Kick-Off meeting, the SQE must ensure that the content of Global APQP Gate Review #1 is included or a separate APQP Gate #1 must be conducted.
SQE	Audit tasks & deliverables identified in the GM Global APQP Supplier Status Summary Workbook Gate 1 (Kick-Off Meeting) / Gate 2 / 3 / 4 / PPAP and Run & Rate for all customer monitored APQP parts.
SQE	At the APQP Kick-off Meeting, review Lessons Learned, SQ SOR GM1927-3 and the Part-Specific Quality & Process SOR (if applicable) to re-emphasize discussion from the Technical Review.
SQE	Throughout the program, ensure Lessons Learned are documented by the supplier in the appropriate FMEA (design, process, system) or DRBFM.
SQE	Confirm that the supplier's process capability and RPN reduction plans will satisfy design requirements and zero PPM requirements.
SQE	Ensure that the supplier's plan for installing capacity, using the GM1927-35 Run at Rate Workbook, is sufficient to meet contractual requirements and pass the Run at Rate.
SQE	Lead Greenfield/Brownfield development assessment process GM1927-31 (if applicable). It is encouraged that the Buyer and the Product Engineer take part in the audits.
SQE	Engage GM Supplier Quality Engineers assigned to Directed Buy sub-components in all Gate Reviews.
SQE	Identify and communicate key timing and program issues to GM management.
Supplier	For customer monitored APQP parts, coordinate the gate reviews after the Gate #1 Kick-Off meeting. For supplier monitored APQP parts, the supplier is expected to conduct and manage all gate reviews after the Gate #1 Kick-Off meeting internally and report the result to GM.
Supplier	For customer monitored APQP, prepare and present to GM APQP Team the current status for tasks & deliverables identified in the GM Global APQP Supplier Status Summary Workbook Gate 1 (Kick-Off Meeting) / Gate 2 / 3 / 4 / PPAP and Run @ Rate Review Audits. For supplier monitored APQP, present internally in a management review and submit the results to GM.
Supplier	Throughout the program, ensure all Timing Charts are adhered to and any necessary recovery plans are comprehensive and protect program timing and objectives. All open tasks, issues and road blocks are to be tracked to closure in the APQP Open Issues List GM 1927-5.
Supplier	Suppliers of systems / assemblies must ensure that subcontractors conduct APQP Gate Reviews and, where necessary, participate in Tier 1 Gate Reviews with GM.
Supplier	Guarantee completion of the APQP Supplier Status Workbook GM1927-34 in line with Expectations.

Reference Documents:

- APQP Supplier Status Workbook GM1927-34

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Task Number: **5**

Task Name: **Timing Chart and APQP Open Issues List**

Task Owner: Supplier

Task Timing: Reviewed at Gate Reviews and throughout the program

Task Description: A detailed review of all timing charts and concerns is conducted periodically to ensure that program deliverables are executed on schedule. These reviews are conducted on GM monitored parts tracked using the APQP process. For supplier monitored APQP, the supplier reviews and updates the Timing Chart and Open Issues List throughout the APQP process.

Key Deliverables:

- Up-to-date APQP Timing Chart GM1927-2 or equivalent format containing all required information (to be uploaded to GQTS at Gate Review #1)
- APQP Open Issues list GM1927-5

Customer for Deliverables: Supplier Quality Engineer

Necessary Inputs:	**Source of Input:**
• Open issues	SQE/Supplier/Engineer/Buyer
• Detailed timing for tooling, facilities, gages, etc.	Supplier

Resources: Supplier, SQE, Engineer, Manufacturing Engineer, and other members of the program team as appropriate

Responsible	Methodology:
SQE	Review the APQP Timing Chart and APQP Open Issues List, minimum monthly.
SQE	Drive supplier to develop recovery plans on issues impacting timing, quality or capacity.
SQE	Identify and communicate key timing and program issues to GM management.
Supplier	Create an APQP Timing Chart GM1927-2 or equivalent and track tasks to completion in line with chart. Create an APQP Open Issues List GM1927-5 and present updates to SQE at all Gate Reviews minimum.
Supplier	Sub-component milestones shall be pulled ahead of Tier 1 assembly milestones by 6 weeks to protect GM program timing.
Supplier	Update timing chart as timing changes occur and communicate any changes, concerns and issues to SQE on an ongoing-basis (maintain additional detail behind each high level APQP Timing Chart item, additional detail must be tied to high level chart to ensure timing is updated automatically).
Supplier	Develop recovery plans for issues impacting timing and drive the plan to maintain program timing.
Supplier	Utilize APQP Open Issues list to capture all issues requiring action.

Reference Documents:

- APQP Timing Chart GM1927-2
- APQP Open Issues list GM1927-5

Advanced Product Quality Planning (APQP)
Global Process

6

Task Number: **6**

Task Name: **QSB – Quality Systems Basics**

Task Owner: Supplier

Task Timing: Gate 1 (Gap Analysis) and Gate 3 (Compliance)

Task Description: QSB is a set of the 10 basic strategies in order to assure quality.

1. Fast Response
   - Communication
   - Problem Solving
   - Lessons Learned
2. Control of Non-Conforming Product
3. Verification Station
4. Standardized Operations
   - Work Place Organization – The 7 Wastes
   - Standardized Work Instructions – SOS
   - Operator Instructions – JES
5. Standardized Operator Training
6. Error Proofing Verification
7. Layered Process Audits
8. Risk Reduction
9. Contamination Control
10. Supply Chain Management

Key Deliverables:
- Action plan for QSB compliance GM1927-30 or Greenfield/Brownfield checklist GM1927-31; (to be uploaded to GQTS at Gate Review #1)
- Full compliance with QSB audit GM1927-30 or Greenfield/Brownfield checklist GM1927-31; (to be uploaded to GQTS at Gate Review #3)

Customer for Deliverables: Supplier Quality

Necessary Inputs:	**Source of Input**
• QSB Audit	Supplier

Resources: SQE

Responsible	**Methodology:**
SQE	Apply the QSB Audit (Gap Analysis) at Supplier Gate Review #1 using QSB audit form GM1927-30. QSB is to be assessed against the manufacturing plant Quality Systems independent of product or specific manufacturing process.
SQE / Buyer / DRE	For Greenfield suppliers, apply the Greenfield & Brownfield Development Assessment Process GM1927-31 in place of QSB.
SQE	Perform QSB workshop as per QSB Presentation GM1927-36 at supplier, if required.
SQE	Monitor the Supplier Action Plan on a timely basis.
SQE	Perform the QSB Compliance Audit and Sign-off the Action Plan final implementation GM1927-30.
SQE	For Greenfield suppliers, Sign-off the Action Plan final implementation of the Greenfield & Brownfield Development Assessment Process GM1927-31.
Supplier	At the QSB Gap Analysis audit, or at the Greenfield & Brownfield Development Assessment Process audit, provide action plans with appropriate detail, timing, ownership, etc.
Supplier	Implement and verify effectiveness of all the action plan items before Supplier Gate Review #3.
Supplier	Keep the customer updated regarding implementation status and any issues or concerns with implementation.

Reference Documents:
- QSB Presentation GM1927-36
- QSB Audit Form GM1927-30
- Greenfield/Brownfield checklist GM1927-31

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Task Number: **7**

Task Name: **Process Flow Charts**

Task Owner: Supplier

Task Timing: Initial chart–prior to sourcing, reviewed at Gate 2 and Gate 3, approved at Gate 4

Task Description: Flow chart provides a logical pictorial representation of the process flow that can be used as the foundation for PFMEA's, control plans, work station layouts, etc.

Key Deliverables:
- Process Flow Chart
- Process Flow Chart depicting sub component production system

Customer for Deliverables: Supplier Quality Engineer

Necessary Inputs:
- Information on each step of the manufacturing process

Source of Input:
Supplier

Resources: Supplier, SQE, Manufacturing Engineer

Responsible	Methodology:
SQE	Review the preliminary process flow chart prior to sourcing to ensure completeness.
SQE	Review the production flow chart for completeness and continue with a comparison to the production line: • Ensure the flow chart is linked to the PFMEA and control plan. • Walk the manufacturing line to ensure the chart is representative of the process and includes receiving, storage, production, inspection, rework, packaging, labeling and shipping. • Ensure Part-Specific Quality & Process SOR (if applicable) is applied to support flow chart development. • Ensure completion in line with AIAG A-6
Supplier	Create a preliminary process flow chart using a similar process as part of bid package requirement.
Supplier	Define a production flow chart once product design is released.
Supplier	Document all items in the flow chart with the respective nomenclature (store, move, inspect, correct, etc.)
Supplier	Ensure the process flow chart is linked to the PFMEA and control plan and complete AIAG A-6.
Supplier	Update flow chart to reflect actual production process.
Supplier	Communicate any changes on an ongoing-basis to SQE.

Reference Documents:
- AIAG Advanced Product Quality Planning and Control Plan manual Process Flow Chart checklist A-6

Advanced Product Quality Planning (APQP)
Global Process

8

Task Number: **8**

Task Name: **DFMEA**

Task Owner: Design Owner (GM Engineer or Supplier)

Task Timing: Initiated before or at design concept

Task Description: The DFMEA is a living document that is initiated before or at design concept and is continually updated as changes occur or additional information is obtained throughout the phases of product development. It supports the design process in reducing the risk of failure by: 1) aiding in the evaluation of design requirements, DFM, and DFA, 2) increasing the probability that potential failure modes have been considered and 3) establishing a priority system for design improvements.

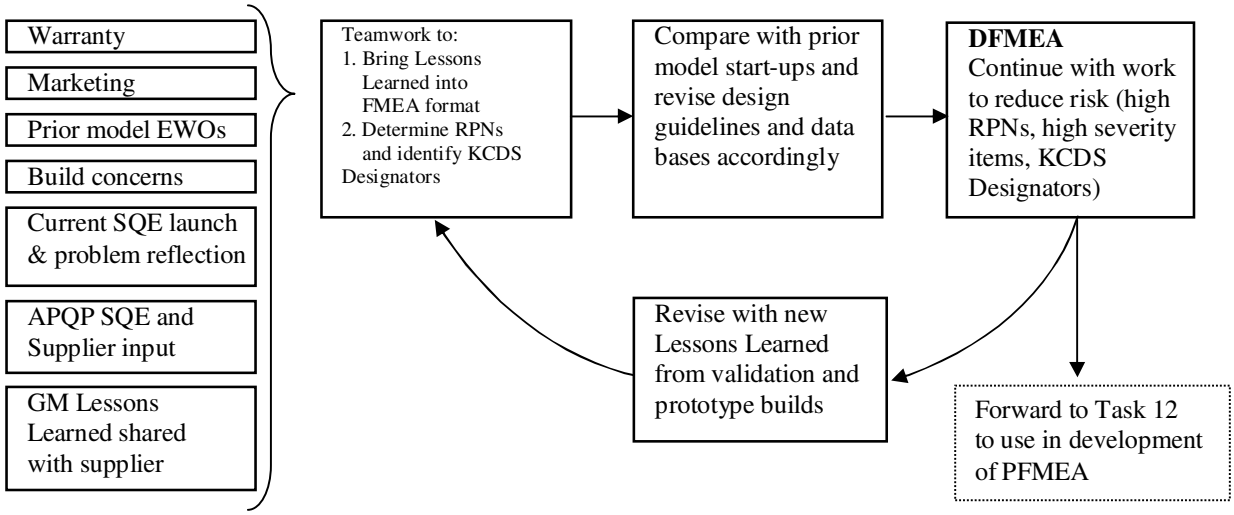
Key Deliverables:
- DFMEA /DRBFM

Customer for Deliverables: Engineer, Supplier, Supplier Quality Engineer

Necessary Inputs:	**Source of Input:**
• Requirements as stated in SOR/SSTS/CTS	Engineer
• Design intent	Design Responsible Engineer
• Vehicle requirements	Engineer
• Manufacturing/Assembly requirements	Design Responsible Engineer
• Lessons Learned /Part-Specific Quality & Process SOR	SQE/Engineer
• KCDS Templates (if already identified)	Engineer

Resources: Engineer, Design Responsible Engineer

Methodology:



Task Number: **8** continued

Task Name: **DFMEA**

Responsible	Methodology:
SQE	Confirm that the Supplier (if not design responsible) is working with the GM Engineer on development of the DFMEA, or DRBFM for any design changes made after production release. If not, take appropriate action to initiate this team activity.
SQE	Confirm with Design Owner if the DFMEA is updated with the results of the DRBFM analysis.
SQE	Confirm a DFMEA has been completed by the responsible Design Owner and confirm that the supplier has access to necessary information from the GM DFMEA as input into the PFMEA.
SQE	Work with supplier to confirm that a DFMEA and System FMEA have been completed for all sub components by the responsible engineering function or the sub contractor.
Design Owner	Lead the workshops with GM DRE, SQE and Supplier Engineering and complete the DFMEA. In addition, complete the Design FMEA checklist (AIAG A-1). Develop and implement RPN reduction plans and strive to continuously reduce RPN, provide a DRBFM analysis for any design changes made after production release, and update the DFMEA with the results of DRBFM analysis.
Supplier	If not design responsible, provide any lessons learned to the GM Engineer and support the development of the DFMEA, and the DRBFM (if applicable). In addition, complete the Design FMEA checklist (AIAG A-1).
Supplier	If GM is design responsible and does not provide access to necessary information from the DFMEA or DRBFM (if applicable), document this issue on the APQP Open Issues List.
Supplier	If the subcontractor is design responsible ensure that the DFMEA is complete for all sub-components. Monitor and drive the development and implementation of RPN reduction plans on sub components.
Supplier	If the subcontractor is not design responsible ensure that any lessons learned are provided to GM engineering for input in developing the DFMEA.

Reference Documents:

- APQP Open Issues list GM1927-5
- AIAG Advanced Product Quality Planning and Control Plan manual Design FMEA checklist A-1
- KCDS Manual GMW15049
- Generic Supplier Analysis/Development/Validation Tasks & Deliverables for All Programs & Commodities GMN 3600
- Design Review Based on Failure Modes GMN 11220

Advanced Product Quality Planning (APQP)
Global Process

Task Number: **9**

9

Task Name: **Design Reviews**

Task Owner: Design Owner (GM Engineer or Supplier)

Task Timing: Initial review–prior to CVER, SVER & IVER; subsequent reviews occur on an on-going basis

Task Description: Reviews to ensure the design has been adequately defined to enable construction of tools and gages.

Key Deliverables:
- Defined and measurable KCDS Designators
- GD&T
- Appearance, performance and material testing specifications

Customer for Deliverables: Supplier

Necessary Inputs:	**Source of Input:**
• SOR / SSTS / CTS	Engineer
• Appearance specifications	Engineer
• Performance and material specifications	Engineer
• Production Assembly Documents if available	Engineer
• Bill of Material (BOM)	Engineer

Resources: Engineer, Supplier Quality Engineer, Supplier, Subcontractors

Responsible	**Methodology:**
Design Owner	Schedule and conduct KCDS workshop. SQE, GM Engineer and supplier participate in workshop. The purpose of the workshop is to define critical product characteristics, and critical process control characteristics.
Design Owner	Schedule and conduct GD&T review. The SQE, GM Engineer and supplier participate in the review. The purpose of the review is to define design dimensioning and tolerance on the drawing as these items relate to the actual function of the part.
Design Owner	For subcomponents, the same process is used to determine lead responsibility in conducting these reviews. Supplier and SQE participate as necessary in the reviews
DRE	GM Engineer is responsible to ensure that all information available in the KCDS template at KCDS website for a specific commodity has been applied, even when supplier is design responsible.
SQE	Ensure the GD&T datum scheme guarantees proper gauging and that there are GD&T callouts for all features which are basic dimensions (performed by SQ Gage Engineer, if available in the region).
SQE	Confirm the selected KCDS Designators can be measured with variable or attribute gages.
SQE/Supplier	Confirm the manufacturing process can achieve the specified tolerances on a sustained basis.
Supplier	Any recommendations / improvements to the design record are documented and submitted to GM for approval.
Supplier	Communicate any concerns relative to the KCDS Designators or GD&T scheme and the manufacturability of the part. Document any open issues on the APQP Open Issues List GM1927-5.
Supplier	Develop an understanding of the engineering change process with the GM Engineer. Apply AIAG Checklist (A-2) and address any open action item.

Reference Documents:
- APQP Open Issues GM1927-5
- KCDS Manual GMW15049
- AIAG Advanced Product Quality Planning and Control Plan manual
- AIAG Design Information Checklist A-2
- General Motors Global Standard, Restricted and Reportable Substances for Parts GMW3059
- Recyclability/Recoverability Design Guide GMW3116

Advanced Product Quality Planning (APQP)
Global Process

10

Task Number: **10**

Task Name: **Tooling and Equipment Reviews**

Task Owner: Supplier

Task Timing: From Tooling Kick Off Meeting (TKO) through PPAP approval.

Task Description: Ensure that the manufacturing process is being designed to the latest drawing change level, built and certified to produce parts with quality at rate according to GM program requirements.

Key Deliverables:
- Process capable Tooling and Equipment delivered on time.

Customer for Deliverables: Supplier Quality Engineer, Engineer

Necessary Inputs:	**Source of Input:**
• Approved GD&T and Math Data	Engineer
• KCDS Designators	Engineer
• Process Capability Requirements	SQE / Supplier
• Timing requirements	Buyer / SQE / Supplier
• Capacity requirements	Buyer
• Error proofing	Supplier
• Functional Test Requirements	Engineer/Supplier

Resources: Engineer, Supplier, Supplier Quality Engineer, Manufacturing Engineer

Responsible	**Methodology:**
SQE	Starting at Gate Review #1 review tooling and equipment concept and pass / fail criteria for component functional test to ensure they can meet product design intent and achieve process capability requirements. Conduct tooling and equipment reviews throughout build process.
SQE	Review timing to obtain tools and equipment and functional test in line with program targets for, PPAP and Run @ Rate. Verify that the supplier has planned (at minimum) and is working to complete and / or tracking the following activities at appropriate time: • GM Engineering Design Releases • Manufacturability Assessment and Tooling Concept • Tooling Design • GM Tooling Purchasing order • Tooling Construction & Try-Out at Tool Shop • Tooling Buy-Off with final equipment at final production location previously to PPAP run
SQE	At the tooling buy-off or PPAP approval, verify the existence of GM owned tooling and that it is properly identified as GM property.
Supplier	Review all timing and inform GM SQE about any changes from original project timing.
Supplier	Design, build and obtain certification of and validation of tooling and equipment as per latest math data.
Supplier	Participate in design reviews with GM and ensure GD&T, KPC, PQC and AQC requirements are included in the tooling, equipment and functional test design. Also ensure tooling and equipment will produce parts to process capability requirements.
Supplier	Inform GM about any design and process changes regarding any new or modified tools, rearrangement of existing tooling or equipment, any product or process changes impacting fit, form, function, performance and durability of saleable product, any test/inspection methods and any new facilities.
Supplier	Prior to tools being grained, dimensional verification is required by GM and Approval to Grain form signed (verify with SQE on regional requirements).
Supplier	Ensure PFMEA has been comprehended and incorporated into tooling and equipment design.
Supplier	Complete the AIAG APQP New Equipment Checklist (A-3).

Reference Documents:
- AIAG Checklist A-3

Advanced Product Quality Planning (APQP)
Global Process

11

Task Number: **11**

Task Name: **Gage Development & Approval**

Task Owner: Supplier

Task Timing: Starting (Concept) at P3 release and complete by PPAP Approval

Task Description: To design, build and certify gages according to latest GD&T release and per GM requirements.

Key Deliverables:
- GM1927-29 fully approved by SQE or GM Gage Engineer 8 weeks prior to PPAP date.

Customer for Deliverables: GM Gage Engineer, GM Supplier Quality Engineer, Manufacturing Location

Necessary Inputs:	**Source of Input:**
• Part Math Data (P2) and GD&T (P3=P2 + 4 weeks)	Dimensional Engineer and Design Engineer
• KCDS Designators	Design Release Engineer
• Gage Design and Build Approval	GM Gage Engineer
• Timing requirements	Buyer / SQE / Supplier

Resources: Supplier, GM Gage Group, SQE, GM Design Release Engineer, Dimensional Engineering

Responsible	**Methodology:**
SQE	Ensure supplier is aware of GM1927-29 and GM 1925 Fixture Standards at Gate Review #1.
SQE / SQ Gage Engineer (SQGE), if Available	Review plans and timing to obtain gages in line with program targets for parts, PPAP and Run @ Rate. Ensure supplier is tracking or executing key tasks on time as Purchase orders are issued - Gage Concept, Gage Design, Construction and buy-off. Conduct gage build reviews at Gage Shops from gage build material schedule to gage buy-off.
SQE / SQGE	Review GD&T, part data and gage expectations starting at Gate Review #1 (APQP Kick-Off).
SQE / SQGE	Review gage concept for the part assembly and sub-components.
SQE / SQGE	Review completed gage design(s) based on gage concepts approved by GM Gage Engineer.
SQE / SQGE	Review construction to ensure that gage meets latest GD&T, agrees with functional part usage / datum strategy and includes measurement of KCDS designators.
SQE / SQGE	Approve gage per GM 1925 Fixture Standards, including: • Ensure that any part changes are incorporated into gages. • Evaluate Coordinate Measuring Machine (CMM) report to ensure gage accuracy. • Ensure gage instructions (ODS) are available at the manufacturing operation. • Verify integrity of gage for fit and function and GR&R (reference MSA AIAG). • Verify that it is properly identified as GM property.
Supplier	Deliver gage request form GM1927-29 at Gate Review #1 and add to PPAP package once gage is finished, form has all tabs filled out and it is approved by GM SQE or GM SQ Gage Engineer, if available in the region.
Supplier	Review timing to ensure compliance and inform GM SQ Gage Engineer and SQE about any changes from original project timing, any design and process changes, any new part math data and/or GD&T changes, any test/inspection methods that include gages, any new facilities that would house the gages.
Supplier	Participate in design reviews, ensure GD&T scheme is released and variable data collectors required by KPC, PQC and AQC release are incorporated into final gage design.
Supplier	Design, build, certify gage dimensionally (including a third party certification), perform complete AIAG MSA (GR&R and Bias study) and meet all requirements established by GM1925. A lean gage (pull ahead CMM holding fixture) should be available for first IVER build.

Reference Documents:
- AIAG Measurement Systems Analysis Manual
- General Motors Fixture Standards GM1925
- Gage Request Certification GM1927-29

Advanced Product Quality Planning (APQP)
Global Process

12

Task Number: **12**

Task Name: **PFMEA**

Task Owner: Supplier

Task Timing: Starting at Kick-Off Meeting and complete by PPAP

Task Description: Ensure that potential failure modes of the process have been considered and addressed to reduce risk of defects through RPN reduction strategy.

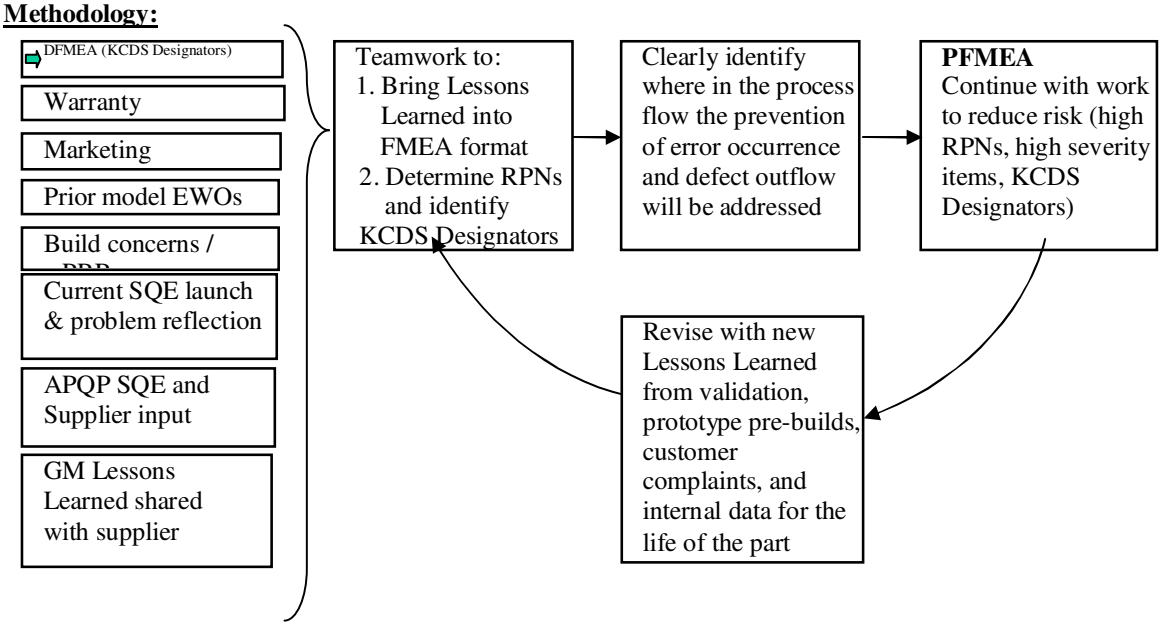
Key Deliverables:
- PFMEA
- AIAG A7 (to be uploaded to GQTS at Gate Review #2)
- RPN Reduction Summary GM 1927-21 (initial to be uploaded to GQTS at Gate Review #2)

Customer for Deliverables: Supplier Quality, Supplier

Necessary Inputs:	**Source of Input:**
• DFMEA	Engineer/Supplier
• Lessons learned and Part-Specific Quality & Process SOR	Supplier/SQE
• Process Flow chart	Supplier
• Warranty data	Engineer/SQE
• PR/R's on similar parts	Supplier/SQE
• Supplier Performance Report	Supplier/SQE
• Supplier's manufacturing process capability on similar parts	Supplier
• Error proofing techniques	Supplier/SQE
• DFM / DFA Workshop results	Engineer/SQE/Mfg

Resources: Supplier Quality, Engineering, Supplier, Manufacturing Engineer and *Assembly Plant

Methodology:



Task Number: **12** continued

Task Name: **PFMEA**

Responsible	**Methodology:** continued
SQE	Attend initial PFMEA development team meeting, provide GM data (Warranty, PR/R's, Lessons learned, etc.), and discuss PFMEA methodology.
SQE	Monitor progression of PFMEA development and confirm participation of multiple cross-functional team members.
SQE	Ensure Part-Specific Quality & Process SOR (if applicable) is applied to support PFMEA development.
SQE	Review RPN Reduction Summary Plans GM 1927-21, and monitor progress at each Gate review and ensure that action plans have been adequately defined for high RPNs and high severity failure modes as required.
SQE	Ensure supplier has completed PFMEA reviews with subcontractors.
Supplier	Initiate PFMEA prior to sourcing as part of the bid package. This preliminary PFMEA should include critical error prevention and error detection ideas and consider any lessons learned from previous programs.
Supplier	Review PFMEA and updated it as necessary each time a design change is made or a processing change is implemented. Any and all potential areas for failure are included in the PFMEA and appropriate corrective actions implemented (a PFMEA should not consider product design changes to compensate the process deficiencies).
Supplier	Prepare PFMEA with input from a multi-disciplinary team (Assembly, Manufacturing Engineering, Materials, Quality, Service, Suppliers, etc.) and identify KCC's for use in control plan.
Supplier	Adhere to PFMEA RPN Reduction Summary GM1927-21, including the categorization of risk, establishment of a top ten list, development of recommended actions, and update on a monthly basis to monitor progress. Apply the AIAG Checklist A-7.
Supplier	Drive simple and inexpensive mistake / error proof devices into the process to help prevent and detect errors.
Supplier	Ensure that all failure modes and related severity numbers from DFMEA are listed in the corresponding PFMEA.
Supplier	Ensure that the current process controls and results of recommended actions on the PFMEA are listed on the control plan.
Supplier	Ensure that the PFMEA has a link with the manufacturing process flow chart and the control plan.
Supplier	If the process, material or manufacturing location changes, revise the PFMEA and re-evaluate the impact on severity, occurrence, and detection ratings.
Supplier	Ensure that subcontractors' PFMEAs are developed and RPN reduction activities are implemented.

Reference Documents:

- AIAG Potential Failure Mode and Effects Analysis Reference Manual
- AIAG Advanced Product Quality Planning and Control Plan manual Process FMEA Checklist A-7
- RPN Reduction Summary Chart GM1927-21

Advanced Product Quality Planning (APQP)
Global Process

13

Task Number: **13**

Task Name: **Control Plans**

Task Owner: Supplier

Task Timing: Initial draft prior to Sourcing, updates parallel PFMEA changes and updates prior to PPAP

Task Description: Define the method to be used to control all KPC, PQC, AQC and DR's (at a minimum) through KCCs for parts being built for vehicle builds, Powertrain, and service applications to ensure customer requirements. Develop in line with the control plan format referenced in the AIAG APQP Manual.

Key Deliverables:

- Control Plan
- Individual Process Control Charts for all KPC, PQC, and DR
- Process Control Plan Audit Checklist GM1927-16 (to be uploaded to GQTS at Run @ Rate Review)

Customer for Deliverables: Supplier Quality, Manufacturing Engineer, Supplier

Necessary Inputs:	**Source of Input:**
• Control plans on similar components	Supplier
• Process Flow Chart	Supplier
• PFMEA	Supplier
• Special Characteristics	Supplier/Engineer
• Lessons Learned	SQE/Engineer/Supplier

Resources: Supplier and SQE

Responsible:	**Methodology:**
SQE	Verify that the supplier used the PFMEA and statistical data to determine what controls are necessary.
SQE	Verify the control plan is linked to the PFMEA and the process flow chart.
SQE	Verify that the control plan covers each phase of the process, including re-work, receiving, in-process operations, packaging, labeling and shipping.
SQE	Ensure Part-Specific Quality & Process SOR (if applicable) is applied to support Control Plan development.
SQE	Verify that the supplier updates the control plan as solutions to open issues are identified.
SQE	Verify that the supplier has individual process control charts for all KPC, PQC, and DR and that they have a means to store and recover this information for a period of 3 years.
SQE	Verify that pre-launch issues have been incorporated into the production control plan.
SQE	Walk the production floor and verify that the controls listed on the plan are in place and being used. Complete the Process Control Plan Audit Checklist GM1927-16 as part of the audit of the production process.
Supplier	Develop a preliminary control plan using an existing control plan on a similar part. This first version of the control plan is then submitted with the quality portion of the supplier's bid package.
Supplier	Develop a pre-launch control plan for use on the first production parts shipped to assembly plants (GP-12) and production control plan using the preliminary control plan as a foundation. The PFMEA and statistical data are used to determine which steps require additional control. The pre-launch control plan does not need to be separated from the production control plan. Pre-launch controls can be documented on the production control plan as long as they are clearly identified as such. Use the pre-launch control plan to validate the effectiveness of the production control plan. Apply AIAG checklist A-8
Supplier	For sample size criteria, as a minimum requirement, adopt for the control plan the GM Manufacture Confidence Level/Sample Size Table.
Supplier	Manufacturing site shall document, maintain, and retain Process Control Plans and Process Control Charts for all characteristics identified as KPC, PQC & DR as established in the Global Supplier Quality Manual GM 1927. Ongoing process control shall be demonstrated (documented) through the continuous use of industry standard statistical methods and process control charts. Process control charts for KPC, PQC, and DR characteristics shall be retained in a recoverable format for a minimum of 3 years.

Task Number: **13** continued

Task Name: **Control Plans**

Responsible:	**Methodology** continued:
Supplier	Develop individual process control charts for all KPCs, PQCs, and DR's based on the control plan using industry standard statistical process control techniques.
Supplier	Ensure the control plan is linked to the PFMEA and process flow chart.
Supplier	Identify and communicate any changes to the GM SQE.
Supplier	Update the control plan as solutions to open issues are implemented.
Supplier	Review control plans of subcontractors.
Supplier	Extend control plan to include installation at assembly plant (if supplier is responsible).
Supplier	Conduct layered audits to verify that the controls listed on the plan are in place and being used.
Supplier	Validate, on a daily basis, that error proofing devices function properly.

Reference Documents:

- Process Control Plan Audit Worksheet GM1927-16
- AIAG Advanced Product Quality Planning and Control Plan manual
- AIAG Control Plan Checklist A-8
- GM Manufacture Confidence Level/Sample Size Table

Advanced Product Quality Planning (APQP)
Global Process

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Task Number: **14**

Task Name: **Early Production Containment (GP-12)**

Task Owner: Supplier

Task Timing: GP-12 start at PPAP non-saleable to meet PPV; containment until achieve agreed exit criteria

Task Description: Establish a containment plan during start-up and acceleration, so that any quality issues are quickly identified at the supplier's facility and not at the GM customer's facility. This procedure applies to all new and changed parts that require PPAP for start-up or acceleration.

Key Deliverables:
- Early Production Containment Plan GP12 Audit GM1927-33 (to be uploaded to GQTS at Gate Review #4)

Customer for Deliverables: GM Manufacturing or Assembly Facility, Supplier Quality, Purchasing

Necessary Inputs:	**Source of Input:**
• Production Control Plan	Supplier
• GP-12 timetable	GM Customer

Resources: Supplier, SQE, Assembly Plant

Responsible:	**Methodology:**
SQE	Ensure GP12 plan is available (agree on timing and exit criteria) at Gate Review #3. Reinforce that failure to execute GP-12, or shipment of a single defect during GP-12 period, will result in immediate CS2.
SQE	Verify that high RPNs, KCDS Designators are addressed by the pre-launch control plan.
SQE	Verify that the supplier used the PFMEA and statistical data to determine what additional controls are necessary (short term capability data on actual process or long term capability data on similar processes).
SQE	Verify any PR/R or pilot issues are addressed by the containment process.
SQE	Review the supplier's containment process and pre-launch control plan using GP12 audit GM1927-33 at supplier plant as soon as GP12 is implemented. Verification should include: • Actual drawings at GP-12 area with the latest change level. • Check frequency (100% or a documented lot sampling with GM approval). • Gage operation instructions at GP-12. • Master parts or boundary samples to confirm inspection. • Inspection data for all components in GP-12 area. • Process in place to prevent shipment of material that has not gone through GP-12. • Record of results.
SQE	Review supplier's initial GP-12 data to assess compliance to process intent.
Supplier	Develop an early production containment plan as specified in GP-12, including, but not limited to: • A separate inspection area whenever possible (may require checks within the process for components that are not available for check after assembly). • Process to ensure that all non-conformances are contained within the facility and prompt containment and irreversible corrective actions are applied if non-conformances are discovered. • Identification of the person responsible for the containment process. • 100% check of specific features for pre-pilot and pilot material, as required. • Use of green dots (signed by a designated senior management representative) on shipping labels to designate compliance. • Use of the Early Production Containment Plan until the agreed exit criteria is met.
Supplier	Root Cause any non-conformances found by GM manufacturing locations and implement additional checking provisions to the pre-launch checklist. Identify and communicate any changes to SQE.
Supplier	Require compliance to GP-12 from all subcontractors, as well as monitor and maintain their records. This will require that subcontractors pull ahead their GP-12 to allow the Tier 1 GP12 timing compliance.

Reference Documents:
- AIAG Advanced Product Quality Planning and Control Plan manual & Production Part Approval Process Manual
- GP 12 & GP-12 Audit GM1927-33

Advanced Product Quality Planning (APQP)
Global Process

Task Number: **15**

Task Name: **Production Part Approval (PPAP)**

15

Task Owner: Supplier

Task Timing: Prior to PPAP Submit Date

Task Description: Determine if all customer engineering design record and specification requirements are properly understood by the supplier and that the process has the potential to produce product meeting these requirements during an actual production run at the quoted production rate.

Key Deliverables:
- Minimum 100% Dimensional OK PPAP Non-Saleable before PPV with Dimensional Report GM1927-32 and GM Worksheet GM-1411, if required (both documents to be uploaded to GQTS at Gate Review #4)
- Full PPAP Approved before MVB Saleable (at PPAP Review)

Customer for Deliverables: Purchasing, Engineering, Supplier Quality, VLE Teams, Assembly Plants Manufacturing Plants, Production Control & Logistics

Necessary Inputs:	**Source of Input:**
• Design Records of Saleable Product	Supplier
• Engineering Change Document	Engineer/Supplier
• General Motors Commodity Validation Sign-Off GM3660, if required	Supplier
• Design FMEA	Engineer/Supplier
• Process Flow Diagrams	Supplier
• Process FMEA	Supplier
• Control Plan (Pre-Launch Control Plan GP-12, plus Production Control Plan)	Supplier
• Measurement Systems Analysis Studies	Supplier
• Dimensional Results	Supplier
• Material, Performance Test Results	Supplier
• Initial Process Study	Supplier
• Qualified Laboratory Documentation	Supplier
• Appearance Approval Report (AAR), if applicable	Supplier
• Sample Product	Supplier
• Master Sample	Supplier
• Checking Aids	Supplier
• Records of Compliance to customer specifics	Supplier
• Part Submission Warrant	Supplier
• Bulk Material Requirements Checklist (for bulk material only)	Supplier

Resources: Purchasing, Supplier Quality, Product Engineering, Material Engineering, Validation Engineering, Dimensional Management, Part Approval Laboratory, Appearance Laboratory, Paint Engineering

Responsible:	**Methodology:**
Buyer	Contract part, establish initial PPAP submission date and enter date into GPS.
SQE	Determine submission level and quantity of samples.
SQE	Confirm PPAP submission date with the supplier and ensure supplier updates GQTS as required.
SQE	Review the submission and determine the PPAP status in accordance with the AIAG PPAP manual. Input the PPAP approval status into the GQTS system. Attach to the PPAP record in GQTS the following documents : • PSW • Dimensional Report • Material and Performance Test Report • AAR (if applicable) • GM1411 (if applicable) • GM3660 (if applicable)
SQE	Notify supplier of part PPAP status.

Task Number: **15** continued

Task Name: **Production Part Approval (PPAP)**

Responsible:	**Methodology** continued:
SQE	Apply the APQP Supplier Status Workbook - PPAP Approval Gate Decision GM1927- 34.
SQE	Drive adherence to PPAP submission date, as scheduled on GM 1927-2 APQP Timing Chart.
SQE	Review PPAP submissions as appropriate and confirm the PPAP status as per the AIAG PPAP manual and GM specifics.
SQE	Ensure adequate recovery plans GM1411 are provided for PPAP without full approval.
SQE	Follow up action items on the recovery plan until full PPAP approval is achieved.
Supplier	Submit PPAP package according to AIAG PPAP requirements for the appropriate submission level on the date agreed on APQP timing chart GM1927-2
Supplier	Provide GM1411 for SQE signature for any part submitted that requires action plan to achieve full approval. Provide any other appropriate signature dependent on issue as required on the GM1411.
Supplier	Provide the samples applied to Matching verification with dimensional inspection results as per Global Part Submission Procedure for Matching GM10067 and Dimensional Report GM1927-32.
Supplier	The supplier shall document containment plans until the SQE is satisfied process capability has been achieved.
Supplier	Shipment of parts for Saleable products is only allowed if the PPAP Status (GQTS PPAP Shipping Status) is Approved or Saleable with a valid expiration date. GM may choose to allow parts with a Non-Saleable Status to ship for a Saleable build but these parts need to be retrofitted before the product is delivered to the customer.
Supplier	Notify SQE before the PPAP re-submission if any process change occurs relative to the previous PPAP review.
Supplier	Guarantee the accomplishment of the APQP Supplier Status Workbook – PPAP Approval Gate Decision.

Reference Documents:

- AIAG Production Part Approval Process manual
- AIAG Statistical Process Control manual
- AIAG Measurement Systems Analysis (MSA) manual
- AIAG Advanced Product Quality Planning and Control Plan manual
- AIAG Potential Failure Mode and Effects manual
- AIAG Quality System Requirements (ISO/TS16949)
- GM Worksheet GM-1411
- General Motors Commodity sign-off GM3660
- Global Part Submission Procedure for Matching GM10067
- GM Customer Specifics – ISO/TS16949

Advanced Product Quality Planning (APQP)
Global Process

16

Task Number: **16**

Task Name: **Run @ Rate (R@R)**

Task Owner: Supplier

Task Timing: Gate 1, Gate 3, and at Run at Rate

Task Description: Verify that the supplier's actual manufacturing process, while operating under normal operating conditions and under total customer requirement, is capable of producing components that simultaneously meet Quality and Daily Contracted Capacity

Key Deliverables:

- Completed R@R Capacity Workbook and R@R for each part
- Verification Supplier can meet Daily Contract Capacity in one day

Customer for Deliverables: Supplier Quality and Purchasing

Necessary Inputs:	**Source of Input:**
• PPAP documentation	Supplier
• GM's daily requirement (LCR)	Buyer
• Supplier's Contracted Tool Capacity	Supplier & Buyer (contract)
• Planned & unplanned downtime record	Supplier
• Written confirmation of quality, capacity and delivery for all sub-components	Supplier

Resources: SQE, Buyer, Engineer, and Supplier

Responsible:	**Methodology**: (refer to R@R diagram at end of the task)
SQE	Ensure the supplier is planning to install the proper capacity to meet the Daily Contracted Capacity through the use of the Capacity Workbook GM1927-35 at Gate 1 and Gate 3.
SQE	Review and status the actual Run at Rate (Customer or Supplier Monitored) data submitted by the supplier to ensure adequate actual installed capacity meets contract requirements.
SQE	Conduct the Gate 1 APQP Kick-off meeting and evaluate the supplier's R@R plan.
SQE	Confirm that the Daily contracted capacity is accurate and is greater than or equal to GM's daily requirement (LCR). If there is a discrepancy or contract capacity information is missing, contact the buyer.
SQE	Complete the Escalation Process for Gate 1 if any contract information missing and forward to SQ Manager.
SQE	Conduct the Gate 3 APQP Review and determine R@R "PASS" metrics and advise supplier.
SQE	Complete the Escalation Process for Gate 3 if supplier did not complete all required information and forward to SQ Manager.
SQE	Attend R@Rs designated as customer monitored. Ensure supplier uses the R@R Hourly Count Sheet. Review documentation, subcontractor requirements, constraint operations and manufacturing process.
SQE	When supplier submits Capacity Workbook, status the R@R. If subcontractor letter is missing status must be a "FAIL" until supplier is compliant.
SQE	Complete the Escalation Process for the R@R if it is a "FAIL" and forward to SQ Manager.
SQE	Enter R@R information in appropriate system.
Supplier	Develop a R@R plan and provide to the SQE at the Gate 1 APQP Kick-Off meeting.
Supplier	Confirm with the SQE that the Daily Contracted Capacity is accurate and is greater than or equal to GM's daily requirement (LCR).
Supplier	Complete the Capacity Workbook (Manufacturing Flow Diagram, Shared Capacity Sheet(s), and Manufacturing System Capacity Estimate) and submit to the SQE prior to the Gate 3 APQP Review. The capacity analysis must show satisfactory results prior to ordering tooling and equipment.
Supplier	Ensure understanding of the R@R "PASS" performance metrics.
Supplier	Conduct preliminary R@Rs and/or simulations prior to the planned R@R to confirm readiness. The PPAP run of parts will be one of the trial runs.
Supplier	Complete verification for all subcontractors, and submit the letter one (1) month prior to the R@R.

Task Number: **16** continued

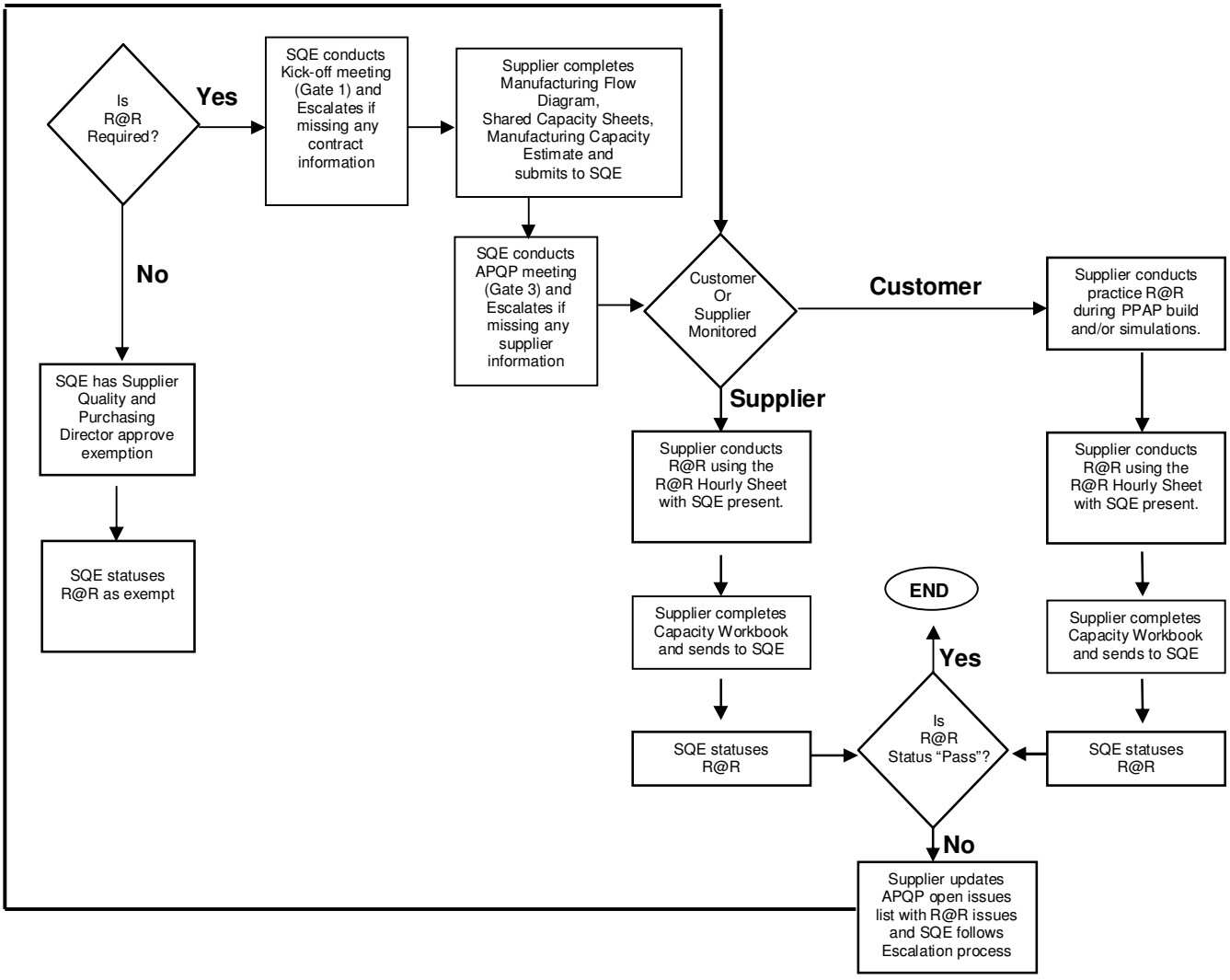
Task Name: **Run @ Rate (R@R)**

Responsible:	**Methodology** continued:
Supplier	Conduct R@Rs on all parts requiring a R@R.
Supplier	Completely fill out the R@R Hourly Count Sheet during the R@R for both the final operation and the constraint operation.
Supplier	Complete the Capacity Workbook for all R@Rs and forward to the SQE within 24 hours.

Reference Documents:

- GM1927-35

R@R Methodology



Advanced Product Quality Planning (APQP)
Global Process

17

Task Number: **17**

Task Name: **Lessons Learned**

Task Owner: Supplier

Task Timing: Commodity Key Stakeholders Meeting through Launch

Task Description: Maximize the knowledge gained from previous programs and not revisit the same quality or design issues.

Key Deliverables:
- DFMEA & PFMEA updated with Lessons Learned gained from this program.
- Part-Specific Quality & Process SOR for key commodities
- Part-Specific Quality & Process SOR updated with Lessons Learned throughout the APQP process

Customer for Deliverables: SQ, Engineering, PDT (Product Development Team), Supplier

Necessary Inputs:	**Source of Input:**
• Existing Lessons Learned for same commodity	SQE/Lessons Learned-website
• Engineering Knowledge for commodities	Engineer
• Process knowledge for same commodity	SQE / Regional Databases

Resources: SQE, Engineering, Lessons Learned website

Responsible:	Methodology:
SQE	**Lessons Learned Update :** **(Commodity Key Stakeholders Meeting):** • Ensure Part-Specific Quality & Process SOR (if applicable) is included in the RFQ package. • The direction for the supplier is to use the information during design and process development. **(Technical Review):** • Provide an overview to suppliers on the lessons learned process and how it fits into APQP. • Ensure that the potential suppliers understand the Part-Specific Quality & Process SOR (if applicable). **(Kick-off Meeting):** • Review any additional information that has been obtained on lessons learned from local or regional databases. • Ensure Lessons Learned issues are incorporated into the APQP Open Issues List GM1927-5. • Ensure that the suppliers understand the Part-Specific Quality & Process SOR (if applicable). • The goal is a zero tolerance for defects.
SQE	Ensure in each of the subsequent Gate Reviews that supplier executes Lessons Learned process (Global APQP task #17) and apply to the Part-Specific Quality & Process SOR (if applicable).
Supplier	**Lessons Learned Update :** Review solutions to issues identified in the Kick-off meeting and new items added to the list: **(Gate Review 2):** after CVER, SVER & IVER **(Gate Review 3):** during integration vehicle builds **(Gate Review 4):** during the Integration & Matching 1 GA **(PPAP):** during the PPV, MVBns **(Run @ Rate):** during the MVBs As solutions are identified, DFMEA, PFMEA, Flow Chart, and Control Plan are reviewed and updated.
Supplier	Contribute with additional lessons learned based on knowledge of the commodity.
Supplier	Adhere to the Part-Specific Quality & Process SOR, (if applicable).
Supplier	Ensure a formal process is in place to update FMEA and control plans based on Lessons Learned.
Supplier / SQE / DRE	Review Lessons Learned from the project and incorporate identified key items into Part-Specific Quality & Process SOR (if applicable) to ensure that future programs do not have the same issues.

Reference Documents:
- GM Supply Power – Part-Specific Quality & Process SOR

Section 2

Global Launch

1

Task Number: **1**

Task Name: **Cross Functional Risk Assessment**

Task Owner: APQP SQE, Launch Leader/Manager

Task Timing: Sourcing and Product/Process Validation Build. Launch Team Assessment a minimum of 6 months prior to SSF. Completion of deliverables by week (32).

Task Description: A process to agree upon Critical / High Risk Suppliers / Parts and Actions required to reduce Launch Risk

Deliverables:
- Updated Risk assessment
- Critical Suppliers Parts List

Necessary Inputs:	**Source of Input:**
GPSC APQP Assessment	APQP SQE

Resources: APQP SQE, Engineer, and Launch Leader/Manager

Methodology:
- Revise Risk Assessment and other known documents
- Consolidate Data and create Critical Suppliers Parts List

Task Owner Responsibility:
- Revise Risk Assessment
- Create Critical Suppliers Parts List

Additional Information:
GPSC APQP Assessment (GM1927-7)

2

Task Number: **2**

Task Name: **GPSC/SQA Launch Team Staffing**

Task Owner: Executive Team, Launch Leader/Manager

Task Timing: Assignment of Launch Leader/Manager a minimum of 6 months prior to build events

Task Description: Staffing of a Program Launch Leader and Support Team

Deliverables:
- Dedicated Launch Team FOCUSED on a Program Launch

Necessary Inputs:
Program Information (Major, Minor, vs. others, etc.)
Staffing Template

Source of Input:
Program Team

Resources: Executive Team, and Launch Leader/Manager

Methodology:
- Determine complexity of Product/Launch (Major, Minor vs. other, etc.)
- Identify resources required per template
- Conduct Kick-off with Plant Manager and Staff
- Resources move on–site to support events at MVB-NS

Task Owner Responsibility:
- Determine staffing needs per program template
- Select resources
- Conduct kick-off
- Move resources on-site

Additional Information:
Staffing Template

Global Launch Process

3

Task Number: 3

Task Name: **Global Launch Matrix**

Task Owner: Launch Leader/Manager

Task Timing: Weekly Reporting (<6 Months), Bi-weekly Reporting (>6 Months)

Task Description: Global Launch Tracking and Reporting

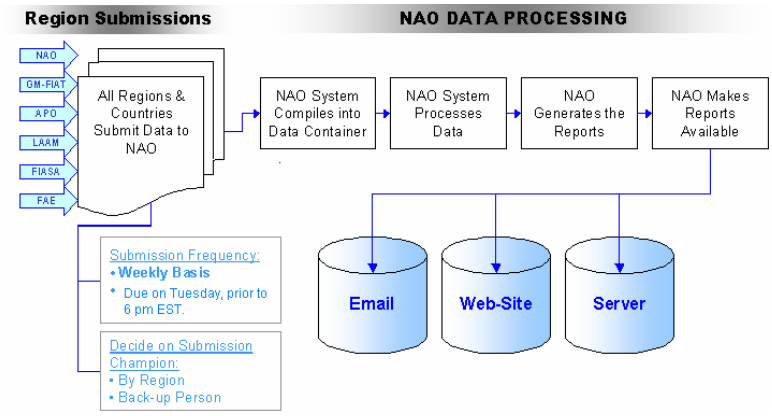
Deliverables:
- At-A-Glance Report providing measurable and status for program, region, and country

Necessary Inputs:
Regional Data Submissions

Source of Input:
Submission Champion

Resources: Submission Champion, Back-up Person

Methodology:
- Submit data to NAO every Tuesday using the data container template
- NAO processes data and creates report
- NAO distributes report globally



Task Owner Responsibility:
- Submit data
- Create and distribute report

Additional Information:
Data Container Template

4

Task Number: **4**

Task Name: **Special Action Teams**

Task Owner: Launch Leader/Manager

Task Timing: As determined by Cross-Functional Risk Assessment

Task Description: A dedicated cross-functional team, which is formed to solve high risk launch issues, and implement the necessary solutions

Deliverables:
- Reduced number of RED issues for a program

Necessary Inputs:
Cross Functional Risk Assessment

Source of Input:
Launch Leader/Manager

Resources: Multiple Cross-Functional Team members as required (Engineering, Manufacturing, Executives, Suppliers, GPSC Purchasing, GPSC PPM, GPSC SQA)

Methodology:
- Identify issues
- Assign appropriate leader and functional support until issue resolution and closure

Task Owner Responsibility:
- Identify issues and assign resources to resolve and close

Additional Information:
GPSC APQP Assessment (GM1927-7)

5

Task Number: **5**

Task Name: **Launch Issue Escalation Process**

Task Owner: Launch Leader/Manager

Task Timing: During all launch phases

Task Description: A process that communicates the issues, creates an overall organizational awareness (as appropriate), and attains support for resolution

Deliverables:
- A well communicated list of high risk launch issues/suppliers
- Engagement of GPSC Leadership and cross-functional partners

Necessary Inputs:	**Source of Input:**
GPSC APQP Assessment	APQP SQE/Launch Leader/Manger

Resources: APQP SQE, Engineer, and Launch Leader/Manager

Methodology:
- May include:
  - Program Reviews
  - Critical Suppliers List
  - ISC (International Sourcing Committee) Presentations
  - Launch Alert Pictorials (Reviews)
  - Conference Calls
  - Executive Conferences
  - Supplier Launch Days
  - Risk Assessments

Task Owner Responsibility:
- Communicate issues through determined methods above

6

Task Number: **6**

Task Name: **Conference Calls**

Task Owner: Launch Leader/Manager (at a minimum)

Task Timing: Starts with Manufacturing Validation Non-Saleable Build and continues through End of Acceleration

Task Description: A communication tool to discuss the status of actions needed to resolve launch issues
Applies to all "Pending Launches" (not yet SSF, but still in some "Manufacturing Validation Build Event") and those "In Launch"

Deliverables:
- Effective communication to quickly inform and determine the next steps

Resources: Multiple Cross-Functional Team members as required (Engineering, Manufacturing, Executives, Suppliers, GPSC Purchasing, GPSC PPM, GPSC SQA)

Methodology:
- Determine the need for the calls (will vary by region)
- Schedule/Conduct call (Daily/Weekly)
- Drive awareness of issues and align team members

Task Owner Responsibility:
- Schedule and conduct calls as required

7

Task Number: **7**

Task Name: **GPSC Executive Supplier Days (Pre-Launch Conference)**

Task Owner: Launch Leader/Manager

Task Timing: 32 to 16 weeks prior to SSF

Task Description: Top Executive meetings in the customer's production facility to gain commitment and to assure focus on Launch Readiness from critical suppliers

Deliverables:
- Focused assessment of critical suppliers' plans for all "High Risk Assessment"/"Launch Readiness issues"

Necessary Inputs:	**Source of Input:**
GPSC APQP Assessment	APQP SQE

Resources: Launch Team, APQP, Current SQE, Engineering, Manufacturing, Materials, GM Executive Leadership, GPSC PPM, and Suppliers

Methodology:
- Conduct Assessment
- Determine Critical Suppliers List
- Invite Internal/External Participants
- Conduct Event
- Determine Next Steps

Task Owner Responsibility:
- Plan and execute conference with critical suppliers

8

Task Number: **8**

Task Name: **Boundary Sample Review (Cross Functional)**

Task Owner: Launch Leader/Manager

Task Timing: Start process at first sample of the production parts from suppliers' production tool. Agreement must be reached by MVBS-1.

Task Description: Cross-functional event(s)* that obtain an agreement of acceptable quality standards of critical commodities

Deliverables:
- Standard cross-functional agreements

Necessary Inputs:	Source of Input:
List of Commodities	GM SupplyPower
First sample of production parts	
Boundary Sample Procedure	

Resources: APQP, Engineering, Manufacturing, and Suppliers

Methodology:
- Obtain list of commodities to be reviewed
- Obtain plant support and identify dates for review
- Conduct event (may be more than one event)
- Determine continuous improvement plan (who/what)

Task Owner Responsibility:
- Determine commodities to review
- Obtain support and determine date
- Conduct review and determine plan

Additional Information:
Boundary Sample Process Guide (available through GM SupplyPower)

9

Task Number: **9**

Task Name: **PCP Verification**

Task Owner: Launch Leader/Manager

Task Timing: Initiate audit process prior to MVNS1 and continue until SSF (or beyond)

Task Description: Critical parts/suppliers audit that verifies the suppliers' manufacturing process controls

Deliverables:
- Ensure supplier's control plans are complete, sufficient, are being adhered to, and support launch

Necessary Inputs:	**Source of Input:**
Process Control Plan Audit Worksheet (GM 1927-16)	GM SupplyPower

Resources: Current SQE, and additional Launch resources

Methodology:
- Determine list
- Conduct visit (utilize standard form for assessment)
- Follow escalation process when PCPA status is not approved or control plan modification/verification resulting from assembly plant builds is required
- Re-visit as required

Task Owner Responsibility:
- Determine critical parts/suppliers to audit
- Conduct audit
- Follow-up as required

Additional Information:
Process Control Plan Audit Worksheet (GM1927-16)

10

Task Number: **10**

Task Name: **Capacity Verification Audit**

Task Owner: Launch Leader/Manager

Task Timing: Compile list 8 weeks prior to SSF

Task Description: An audit that verifies critical suppliers' capacity for production

Deliverables:
- Known supplier's capacity information

Necessary Inputs:
Critical suppliers list

Resources: APQP SQE/Manager

Methodology:
- Assess program
- Compile list
- Contact SQE/Manager responsible for critical suppliers
- Schedule R @ R
- Review results
- Determine next steps

Task Owner Responsibility:
- Determine critical suppliers for program
- Review R @R results
- Determine next steps

Global Launch Process

Number: **11**

11

Task Name: **Proactive CS2**

Task Owner: Launch Leader/Manager

Task Timing: MVBS (or SSF) to EOA (depending on production volume)

Task Description: Key high-risk parts and processes are identified by the Launch Project Team as critical to the success of Flawless Launch. A Third-Party company is used to inspect and evaluate parts prior to shipment into the assembly plant (Controlled Shipping II GM 1927 Current Task 9). If defective material is identified during the redundant shipping process, the supplier assumes all cost associated with Proactive CS 2. If no defective material is identified the customer assumes responsibility for cost.

Deliverables: Minimized risk to Program Launch

Resources: Current Supplier Quality Engineer, Program Launch Team, Third Party Providers, Financial Department, and Manufacturing

Methodology:

- Parts and/or processes are selected according to risk level or criticality of the part or supplier to the Program's Launch
- Suppliers are notified that their parts that have been placed into the Proactive CS 2 process
- A third-party company is contracted by the customer to apply Controlled Shipping II procedures at the suppliers location
- Characteristics are defined by the SQE in conjunction with the supplier to be inspected by the third-party company prior to shipping the parts to the customer's plant
- Costs:
  - If failed parts are found by the third-party company, the costs are the supplier's responsibility
  - In case of zero defects, the **c**ustomer absorbs the costs

Task Owner Responsibility:

- Identify suppliers to be placed into Proactive CS2
- Identify work order numbers and accounts to fund Proactive CS2 process if no defective material is identified
- Send request to Current SQE to initiate Proactive CS2 letter to suppliers

Additional Information

GM 1927 – Global Supplier Quality Manual
GP5 – Supplier Quality Processes and Measurements Procedure

*Powertrain initiative only

- Increased confidence in problem containment and correction
- Complete understanding of the controlled shipping plan

Section 3

Global Current

Document Usage Guidelines by Global Region

F = Reference Only (Information only, Nothing to fill out)
NA = Not applicable for specified region
MD = Mandatory Document (document type required, specific format required)
MI = Mandatory Information (document type required, format may vary, minimum content mandatory)
RD = Recommended Document (document recommended, specific format required)
RI = Recommended Information (document recommended, format may vary)

Document	Number	AP	GME	LAAM	NA
Controlled Shipping Assessment Matrix	GM 1927-51	MI	MI	MI	MI
Controlled Shipping Assessment	GM 1927-52	M	M	M	M
Controlled Shipping Confirmation Reply Form	GM 1927-53	MI	MI	MI	MI
Controlled Shipping Verification Exit Checklist	GM 1927-54	RD	RD	RD	RD
Controlled Shipping Level 1 Entry letter	GM 1927-55	MI	MI	MI	MI
Controlled Shipping Level 1 Exit Letter	GM 1927-56	MI	MI	MI	MI
Controlled Shipping Level 2 Entry Letter	GM 1927-57	MI	MI	MI	MI
Controlled Shipping Level 2 Exit Letter	GM 1927-58	MI	MI	MI	MI
Controlled Shipping Kick-off Meeting Worksheet	GM 1927-59	MD	MD	MD	MD
CSL2 Purchase Order Addendum, as required	GM 1927-60	NA	MD	NA	NA
Cross Regional Support Request	GM 1927-61	MI	MI	MI	MI
CT Quality Action Plans	GM 1927-62	RI	RI	RI	RI
Executive Champion Add/Remove Form	GM 1927-63	RI	RI	RI	RI
Functional Supplier Assessment (FSA)	GM 1927-64	MI	MI	MI	MI
Global Emerging Issue Alert	GM 1927-65	MI	MI	MI	MI
I-Chart	GM 1927-66	RI	RI	RI	RI
New Business Hold Process Flow	GM 1927-67	F	F	F	F
Process Control Plan Audit (PCPA)	**GM 1927-16**	MD	MD	MD	MD
Process Control Plan Worksheet	GM 1927-68	MI	MI	MI	MI
PRR Read Across Matrix	GM 1927-69	MI	MI	MI	MI
QSB Audit	GM 1927-70	MD	MD	MD	MD
Quad Report	GM 1927-71	MD	MD	MD	MD
RPN Reduction Summary	**GM 1927-21**	MD	MD	MD	MD
Shop Floor Excellence (SFE) Audit	GM 1927-72	MD	MD	MD	MD
Shutdown/Start-up audit	GM 1927-73	MD	MD	MD	MD
Shutdown/Start-up Introduction Letter	GM 1927-74	MI	MI	MI	MI
Spill Agenda Format	GM 1927-75	MI	MI	MI	MI
SPR Agenda Format	GM 1927-76	MI	MI	MI	MI
SQIM Agenda Format	GM 1927-77	MI	MI	MI	MI
Step Down Chart	GM 1927-78	MD	MD	MD	MD
Supplier Action Plans	GM 1927-79	MI	MI	MI	MI
Supplier Performance Assessment Matrix - SPAM	GM 1927-80	RI	RI	RI	RI
Systemic Quality Performance Matrix (SQPM)	GM 1927-81	RI	RI	RI	RI
Top Focus Add/Remove Form	GM 1927-82	RI	RI	RI	M
Top Focus Process Notification Letter	GM 1927-83	RI	RI	RI	M
5 Whys 3 Times	GM 1927-84	MI	MI	MI	MI

All documents can be found at:
https://www.gmsupplypower.com/apps/supplypower/NASApp/spcds/CDSRetrieval?lob=quality&subnav=library&togglefolder=1606

Training Available to Suppliers through 3rd Party Providers

Training (Workshops)	APO	GME	LAAM	NA
5S / Visual Workplace				X
Applying SPC Tools				X
Error Proofing				X
Job Set Up Optimization & Error Proofing				X
Label Error Proofing				X
PFMEA				X
Problem Solving				X
Quality Systems Basics			X	X

Approved 3rd Party Providers (Training/Implementation)

Approved Providers	Training	Error Proofing Training	Label Error Proofing Training	5S & Visual Workplace Training	Problem Solving Training	Applying SPC Tools Training	Job Set Up Error Proofing & Optimization Training	CS2 Implementation
The PIC Group	X	X	X	X	X	X		X
Benchmark Technologies	X			X	X	X		
Luminous Group	X	X		X	X		X	
VQQ Inc.	X	X			X	X		
Eastern Michigan University	X							
PDC		X	X		X			X
Product Action			X					X
CEI			X					
EDS			X					

This information accurate as of December 1, 2003. Up-to-date information on training and providers can be obtained at CS and QSB Third Party Providers

Global Current Process

1

Task Number: **1**

Task Name: **Continuous Improvement**

Task Owner: Supplier Quality – Current Product

Task Timing: Throughout the life cycle of the part

Task Description: Defines the supplier's responsibility to have an on-going process for continuous improvement of the product and related manufacturing processes; reference GP-8. The intent is to reduce variation and to ensure process stability and capability over time. Suppliers are required to measure their first time quality, update FMEAs, Process Flow Diagrams, and Control Plans based on actual performance, and have an ongoing RPN reduction process that drives error proofing. There must be a performance attitude for zero defects.

Criteria for Application: Applies to all suppliers and products for the life of the part.

Deliverables:

- First Time Quality Trend Chart (I-chart recommended)
- PRR Analysis Summary
- 5 Whys 3 Times (GM 1927-84)
- PFMEA - Revised
- Operator Standardized Work Instructions - Revised
- Process Control Plan **-** Revised
- RPN Reduction Summary (GM 1927-21) as required
- Supplier Action Plans (GM 1927-79)
- PRR Read Across (GM 1927-69)

Customer for Deliverables:
GM Assembly/Manufacturing Plants
Supplier
Supplier Quality Engineer
Supplier Quality Management

Necessary Inputs:	**Source of Input:**
• Lessons Learned	Supplier
• Internal (FTQ, Process Capability, etc.)	Supplier
• External Data Analysis (6-Panel, Warranty data, etc.)	SupplyPower

Resources:
Supplier
Supplier Quality Engineer

Methodology:

- Suppliers are required to have a continuous improvement process that is documented and institutionalized. This process should consist of the following elements:
  - Measure First Time Quality (FTQ)
  - Effective Root Cause Analysis and Corrective Action Verification
  - Update FMEAs , Process Flow Diagrams, and Control Plans
  - RPN reduction process
  - Lessons Learned process

Task Number: 1

Task Name: Continuous Improvement

Methodology (continued):

- Supplier Quality Engineer is to monitor and audit the supplier's compliance to Continuous Improvement requirements.
- Supplier Quality Engineer is to communicate specific concerns to the supplier for non-conformance, review action plans (as required), escalate concerns to leadership (if required), and require the supplier to implement countermeasures (if necessary).
- Supplier is required to respond to concerns/issues identified by the SQE, and to develop and implement appropriate action plans to meet requirements.

- **Measure First Time Quality.**
  - First time quality is a measure of a process' ability to make quality parts without scrap or rework. The rework of parts can result in undesirable variation and may take parts out of process if the rework was not initially comprehended in the process.
    - 1^{st} time quality % = $\frac{N-(S+R)}{N} \times 100$

      N=number of parts started in the process
      S=number of parts scrapped
      R=number of part to be reworked/repaired

  - FTQ should be measured at the following locations:
    - End of line FTQ measurement (at a minimum)
    - Quality gates or verification stations for key processes

  - Quality gates or verification stations should include the following elements:
    - Alarm limits established (e.g. 2 defects per hour) to drive immediate containment upstream in the process
    - A Pareto of failure modes for a specific timeframe
    - FTQ trend chart (I-Chart format recommended – GM 1927-66)

- **Effective Root Cause Analysis and Corrective Action Verification**
  - The supplier is required to perform an effective analysis of root cause (5 Whys 3 Times recommended – GM 1927-84).
  - Verification and validation of corrective action should demonstrate the ability to turn the problem on and off.

- **Update Quality Documentation**
  - The supplier is required to update and revise the FMEA, Control Plan, and Standardized Work.
  - The revisions are not only required when there are design or process changes, but are based on internal or external data.
    - Internal data should drive quarterly updates at a minimum
    - External data should drive monthly updates at a minimum

- **RPN Reduction Process**
  - Supplier is required to have a formal and documented RPN reduction process which includes:
    - A cross- functional team that meets regularly and updates FMEA and Control Plans
    - Collection of external and internal data relative to rejects (scrap and rework)
    - Incorporation of internal data (FTQ, scrap, etc.) and external data (PRR, etc.) into the FMEA and validation that assigned RPN numbers are reasonable and accurate
    - Identification and implementation of action plans with timing and accountability

.

- **Utilizing a Lessons Learned process**
  - Supplier should have a process in place, which would drive lessons learned into current and future application of FMEAs and Control Plans.
  - The process should apply lessons learned by a look across of similar processes within the facility and within the company (recommend PRR Read Across – GM 1927-69).

Global Current Process

Task Number: **1**

Task Name: **Continuous Improvement**

SQE Responsibility:

- Monitor/audit the supplier's conformance to the requirements.
- Identify and communicate to the supplier concerns/issues relative to conformance to requirements.
- Escalate to leadership, as necessary.
- Review Supplier Action Plans, if necessary.
- Follow up, as necessary.

Supplier Responsibility

- Measure First Time Quality at end of process and at key processes.
- Understand failure modes.
- Update FMEAs, Control Plans, and Standardized Work as defined.
- Implement a formal and documented RPN reduction process.
- Utilize lessons learned.

Additional Information:

GP-8
PRR Read Across (GM 1927-69)
RPN Reduction Summary Chart (1927-21)

***SQE denotes GM Supplier Quality Engineer or approved GM SQ Representative.**

2

Task Number: 2

Task Name: **QSB – Quality Systems Basics Workshop**

Task Owner: GPSC - Current Supplier Quality or Advance Supplier Quality

Task Timing: Throughout life of product

Task Description: QSB is a two-day workshop at the supplier's plant that teaches, develops, and facilitates implementation of the 9 basic strategies of quality. The intent is to share best practices and to understand the gap between the present state and the best practice. The workshop will include multi-disciplinary employees from all levels of the supplier to develop the foundation for each strategy using data available at the plant.

1. Fast Response
2. Control of non-conforming product
3. Risk reduction
4. Standardized operator training
5. Standardized work
6. Layered audit
7. Error proof verification
8. Care (Customer Acceptance And Review Evaluation)
9. Lessons learned

Criteria for Application:

- Reactive, as a consequence/ exit criteria for Controlled Shipping or Top focus
- Proactive, to enhance a supplier's quality system

Deliverables: Completed action plans (Master Dot Methodology optional)
Pass QSB Audit

Customer for Deliverables: Supplier Quality, Supplier, and Trainer

Necessary Inputs:	**Source of Input**
Supplier Performance Report (6-Panel)	Supply Power
Internal & External data analysis	Supplier
Internal documentation (i.e. Training documentation)	Supplier
Creativity Team Bid List	Supply Power

Resources: Certified Trainer (Supplier Quality Engineer or Third Party Provider)
Multi-functional team from supplier (typically 12-15 people)
Supplier's Leadership

Methodology:

Pre-work

- SQE does the following:
  - Identify suppliers to be trained.
  - Provide overview of QSB to suppliers individually or at a supplier symposium (purpose, content, benefits, successes).
  - Inform suppliers of why QSB is recommended or required.
  - Agree on a method of training (i.e. supplier pays third party trainer, GM provides training).
- A QSB audit by a certified SQE could be done to determine the necessity for a workshop.
- Supplier designates a champion for training and implementation process.
- Supplier and Trainer make arrangements for a two-day workshop.

Task Number: **2**

Task Name: **Quality Systems Basics**

Methodology (continued):

Conduct workshop

Day 1: Morning – Workshop participants and Supplier Leadership
- Present "Why we are here."
- Train team on the 9 strategies of QSB (defining "desired state").

Day 1: Afternoon – Workshop participants
- Divide participants into 3 workshop teams (typically) to cover the 9 strategies.
  - Risk Reduction, Error Proofing Verification, and Lessons Learned
    - Manufacturing, Maintenance, Operators, Supervisors, Auditors
  - Operator Training, Standardized Work, and Nonconforming Product
    - Supervisors, Operators, Training or HRM, Manufacturing, Quality
  - Layered Audit, C.A.R.E., and Fast Response
    - Operations Manager, Quality Manager, Operators
- Analyze the current quality system, identify gaps, and create suggestions/forms/next steps to implement each strategy.

Day 2: Morning to 3:00 p.m. (15:00) – Workshop participants
- Work groups continue developing the next steps and actions with the supplier's quality data.
  - Suggestions for forms, tracking methods, management review timing, and communication
- Work groups formulate a presentation of their progress with the following format:
  - Team introduction
  - Strategy being presented
  - Requirements and the status for each
  - Suggestions for improvement
  - Action Items
  - Questions and comments

Day 2: Afternoon – Workshop participants and Leadership
- At approximately 3:00 p.m. (15:00) the teams provide a ten-minute presentation for each strategy to workshop participants and supplier's leadership.
- Following the presentations, GM and the supplier staff provide a short wrap up in regards to the findings and the required follow up.

Follow-Up
- Supplier develops an Action Plan (Master Dot Methodology suggested) to track implementation of the key strategies and improvements.
- SQE/Trainer approves and monitors the Action Plan on a timely basis.
- Upon completion of Action Plan tasks, the SQE/Trainer conducts a QSB audit to assess level of implementation.
- GM may request / require the supplier to contract an approved GM third party for any or all of the above listed activities.

SQE Responsibility

- Facilitates activities with GM Third Party Approved Provider (optional).
- Monitors action plans.
- Conducts QSB audit and provides status.
- Provides appropriate follow up.
- Participates or conducts workshop (optional).

Task Number: **2**

Task Name: **Quality Systems Basics**

Supplier Responsibility

- Assumes responsibility and takes ownership of all activities to implement QSB.
- Advises the customer of implementation status and any foreseen impending problems.
- Provides action plans with appropriate detail, timing, ownership, etc.
- Implements action plan on a timely basis.

Additional Information:

- QSB Management Manual - QSB website (www.gmcs2.com)
- Layered Audit video

**** SQE denotes GM Supplier Quality Engineer or approved GM SQ Representative***

3

Task Number: **3**

Task Name: **Shutdown / Startup Activity**

Task Owner: SQ Representatives

Task Timing: Throughout the life of the product

Task Description: The purpose of the Shutdown/Startup Activity (**SD/SU**) is to implement standardized work for both the Supplier Quality Group and its suppliers, specifically focused around extended shutdown periods and subsequent startups. Examples include: Corporate ("summer") shutdowns, Christmas shutdown, etc., but the task and tools can be used by any supplier when they are faced with any extended shutdown/startup, such as the elimination and/or restarting of a production shift or an extended weekend.

The goal of the Shutdown/Startup Activity is ZERO major disruptions caused by a supplier's shutdown and subsequent restart of operations.

Criteria for Application:

- Extended shutdown periods, such as the "Summer Shutdown", "Christmas Shutdown"
- Selected high-risk suppliers based on established criteria

Deliverables:

- Completed Shutdown audit form from suppliers
- Master Dot tracking sheet for High risk suppliers

Customer for Deliverables: SQE, SQ Leadership, Buyer

Necessary Inputs:	**Source of Input:**
Shutdown/Startup Audit Form (GM 1927-73)	Supply Power
Master Dot tracking Form	Supply Power
High Risk Supplier Listing with CEO & Plant Manager, Names, e-mail addresses	GQTS

Resources: SQ Process/Data Group (where applicable)

Methodology:

Planning Phase

- Supplier Quality Leadership identifies a Supplier Quality Shutdown/Startup Coordinator for the region.
- The Coordinator does the following:
  - Identifies a representative for each SQ team who will participate in the Shutdown/Startup (SD/SU) activity.
  - Holds an initial conference call with the representatives to review objectives, the process and key dates.
  - Identifies key criteria for selecting targeted suppliers for the SD/SU Audit activity. Suggested criteria may include:
    - Spills, downtime, and emerging issues during a specified period
    - Red Launch Alerts
    - CS2 activity for a specified period
    - Number of CS2's over 90 days

Task Number: 3

Task Name: **Shutdown / Startup Activity**

3

Methodology:

Planning Phase (Continued):

- High PPM or discrepant parts for a specified period
- Warranty or Customer Satisfaction spikes for a specified period
- Previous evidence of poor startup at the supplier

Note: criteria may be weighted to reflect severity

- Communicates the criteria to the SQ representatives in each team.
- Documents the SQE's standardized work as part of the SD/SU Audit activity.
- Develops the standardized communication/e-mail to be sent to each supplier as part of the SD/SU activity. This should include at minimum:
  - An introductory letter explaining the SD/SU activity objectives and expectations
  - Presentation for the supplier explaining GM's lessons learned
  - The standard SD/SU audit forms or a link to a web-based SD/SU audit survey

- The SQ Representative from each SQ Team does the following:
  - Identifies the suppliers to be targeted for the SD/SU activity based on the criteria provided
  - Assigns SQE's to perform the standardized SD/SU work.

- The SQE performing the SD/SU Audit Standardized work does the following:
  - Obtains the contact information for the assigned supplier(s), including the CEO and Plant Manager name, phone and e-mail address.
  - Sends the standardized communication/e-mail to the supplier.

Implementation Phase:

- The Supplier does the following:
  - Performs a self-assessment of their shutdown/startup readiness using the SD/SU audit and supporting documentation provided by GM.
  - Completes the SD/SU audit form and returns to the assigned SQE with appropriate supporting documentation/evidence, or completes the web-based SD/SU online survey (if available).
  - Develops an action plan to resolve any issues identified in the self-assessment and implements containment and/or corrective actions. Sends the action plan to the assigned SQE.

- The SQE performing the SD/SU Audit Standardized work does the following:

  - Reviews the supplier's self-assessment on the shutdown/startup audit form or survey, looks for evidence to support the supplier's self assessment, and challenges the supplier if no evidence in provided.
  - Gives the supplier an overall R-Y-or G rating and updates the supplier's status on a master tracking list (master dot format recommended).
  - For Yellow suppliers, at a minimum, the SQE contacts the supplier to obtain clarification/evidence or further feedback on the open issues, and to request a supplier action plan if required.
  - For Red Suppliers, the SQE does an onsite review at the supplier location to resolve any red issues and review the supplier's action plans.
  - Places the supplier into GP-12 or CS2 until all open issues are resolved.

Monitor/ Check Phase:

- The SQE does the following:
  - Reviews the supplier's progress in resolving open issues and in implementing the action plan
  - Updates the supplier's R-Y-G overall status on the master-tracking list.

Global Current Process

Task Number: **3**

Task Name: **Shutdown / Startup Activity**

SQ Shutdown/Startup Coordinator Responsibility:

- Establish the Shutdown/Startup Team.
- Establish the criteria for identification of high-risk suppliers.
- Establish critical dates.
- Establish standardized work for on-site visits.

SQ Shutdown/Startup Team member Responsibility:

- Select the suppliers to be targeted in the SD/SU activity.
- Assigns SQE's to the targeted suppliers.

Supplier's Responsibility:

- Reviews and rolls out GM Shutdown/Startup presentation internally.
- Perform the SD/SU audit self-assessment.
- Complete the SD/SU audit form or the web-based online SD/SU survey (if available).
- Develop an action plan to resolve any open issues and review with the assigned SQE.
- Implement GP-12 or CS2 as required.

SQE Responsibility:

- Obtain key contact information for assigned suppliers.
- Send the standardized communication/e-mail to the assigned supplier.
- Review the assigned supplier's self-assessment.
- Evaluates the suppliers as R-Y-G.
- Review open issues and action plans with the supplier.
- Implement GP12 or CS2 until issues are resolved.
- Update the supplier's status on the master tracking form.

Additional Information:

- Previous Shutdown Audit, if applicable.
- Shutdown plan presentation.
- Shutdown-Startup-Spill Prevention Agenda.
- SQE standardized work for onsite visits.

** SQE denotes GM Supplier Quality Engineer or approved GM SQ Representative*

Task Number: 4

Task Name: **Process Control Plan Audit**

Task Owner: Supplier Quality Engineer

Task Timing: Throughout the life of the product

Task Description: The purpose of the Process Control Plan Audit is to ensure the supplier is following the documented Process Flow Diagram and executing the Process Control Plan that was the basis for PPAP. It is also to ensure the supplier is maintaining and updating said documents, including Process Flow Diagrams, PFMEAs, and Process Control Plans, while executing continuous improvement.

Criteria for Application:

- To review the supplier's manufacturing process during any onsite visit
- To investigate a potential nonconformance
- To better understand the supplier's process
- To verify corrective action implementation and update documentation for a quality issue

Deliverables:

- Process Control Plan Audit Sheet (GM 1927-16)
- Process Control Plan Worksheet (GM 1927-68)
- Supplier Action Plan (GM 1927-79), if required, approved by SQE

Customer for Deliverables: SQE, SQ Manager, Supplier

Necessary Inputs:	**Source of Input:**
PRR Analysis Summary	GQTS
Supplier's Internal Data Analysis	Supplier
Process Flow Diagram	Supplier
PFMEA	Supplier
Process Control Plan	Supplier

Resources: Supplier representative, SQE

Methodology:

Assessment Phase (Prior to Visit)

SQE does the following:

- Decides or is assigned to visit a supplier to:
  - Review a specific issue/concern
  - Review an overall performance concern
  - Gain a better understanding of the supplier's processes, etc.
- Reviews appropriate external performance data. Data should include 6 Panel Charts, PRRs, or a specific part/process concern.
- Contacts supplier's Quality Manager to explain the nature of the visit and identify specific expectations relative to documents (such as part print, FMEA's, Process Control Plan, etc.) that need to be ready for review.
- Identifies which product or process requires a PCP audit.
- Determines if short form or long form review is appropriate.
  - Short form provides initial assessment, generally used as a proactive measure (app. 2-4 hrs.)
  - Long form provides detailed assessment, generally when issues are suspected (app. 8 hrs.)

Task Number: **4**

Task Name: **Process Control Plan Audit**

Methodology (Continued):

Entry/Implementation Phase (Conduct Audit)

SQE does the following:

- Ensures that appropriate supplier representatives participate in the audit.
- Utilizes PCPA worksheet to identify concerns.
- Summarizes the audit using PCPA form (GM 1927-16).
- Ensures the Supplier understands documented concerns/non-conformances.
- Rates the audit as "Approved", "Approved as Noted", or "Not Approved" as appropriate.
- Implements appropriate action, if necessary, to ensure conformance to requirements and reduce risk of major non-conformances; such as containment, CS1 or CS2.
- Summarizes expectations relative to:
  - Immediate corrective actions
  - Action plans, format and due dates
  - Follow-up time frame
  - Additional requirements and expectations

Supplier implements any additional internal process controls required to reduce the risk of major non-conformance immediately, to insulate the GM Manufacturing facility or the Containment Gate.

Monitor and Check Phase

- Supplier develops, documents, and implements action plans.
- SQE approves action plans and ensures proper follow up to validate implementation and effectiveness of action plan.

SQE Responsibility:

- Performs necessary pre-work and notification to the supplier.
- Reviews Process Flow Diagram's, PFMEA's, and Control Plans on site at the supplier.
- Executes the PCP audit.
- Completes PCPA worksheet and summary.
- Rates the Audit.
- Ensures supplier understands concerns.
- Initiates appropriate action to reduce risk of major non-conformances from being shipped.
- Approves supplier action plans.
- Provides appropriate follow up.

Supplier Responsibility

- Provides requested documents and participate in PCP Audit.
- Understands concerns/non-conformances identified by the SQE.
- Implements any immediate containment/addition process controls as directed.
- Develops, documents, and provides action plan with appropriate detail, timing, ownership, etc.
- Implements action plan on a timely basis.

Additional Information:

Supplier Action Plan (GM 1927-79)
Continuous Improvement (GP-8)

**** SQE denotes GM Supplier Quality Engineer or approved GM SQ Representative***

5

Task Number: **5**

Task Name: **SQE Creativity Team Support**

Task Owner: GPSC – Commodity Quality Integration

Task Timing:

Task Description: SQE Creativity Team (CT) support is a process to drive quality in the Creativity Teams by providing the voice of Current Quality into the GPSC sourcing process. Through the creation of CT quality action plans, SQE's engage the CT in strategic and up-front activities to grow, fix, or exit suppliers on the Creativity Team Bid List (CTBL). Additionally, CT quality action plans may be utilized to direct SQ resources and/or complement the Top Focus process. The SQE assigned to the Creativity Team provides the voice of the customer through feedback from Current Supplier Quality into the Creativity Team.

Deliverables:

- CT Quality Action Plans (GM 1927-62)
- Updated CT Bid List
- Grow-Fix-Exit Strategy
- Step-down Charts (GM 1927-78)
- Top Focus Add/Remove Form (GM 1927-82), Optional

Customer for Deliverables: Supplier, Supplier Quality, Creativity Team.

Necessary Inputs:	**Source of Input:**
Performance Report (6 Panel)	Supply Power
Creativity Team Bid List (CTBL)	Supply Power
Quality Progress Chart	Supply Power
PRR detail review-6 months	GQTS
Supplier's Internal Data Analysis	Supplier
CT Roll out schedule	CT Leader
CT Roles and Responsibilities Handbook	Supply Power

Resources: Supplier Quality Engineer, Buyer, CT Leader, Commodity Manager, Supplier

Methodology:

Assessment Phase

- SQE reviews necessary inputs as identified above.
- SQE schedules a meeting with the CT leader to:
  - Understand commodity key drivers
  - Review necessary inputs as identified above
  - Develop a CT Quality Action Plan (Grow-Fix-Exit strategy) for the CT

Task Number: **5**

Task Name: **SQE Creativity Team Support**

Implementation Phase

- SQE does the following:
  - Attends all scheduled CT meetings to understand business plan, present quality data, and CT's quality status.
  - Reviews CTBL and identifies which suppliers are non-green for quality.
  - Reviews and updates the Grow-Fix-Exit strategy with the CT Leader.
  - Completes CTBL add/delete form and reviews with CT Leader for approval prior to submitting request to CQI team leader/manager.
  - Creates CT quality action plans for specific non-green "Fix" suppliers and determines actions necessary to turn suppliers green for quality.
  - Contacts non-green suppliers to review quality status and implement necessary corrective actions:
    - Contact is made with suppliers' executive leadership to ensure they are aware of the quality issues and are engaged in implementing the necessary corrective actions.
    - Request detailed action plan from the supplier
    - If supplier is in another region (region outside of home region), SQE shall contact regional counterpart for assistance and follow-up.
  - Engages CT Leader to drive supplier in making the necessary quality improvements when needed.
  - Develops schedule for supplier quality reviews at CT meetings and communicates to all participants.
  - Develops supplier quality review meeting agenda and supplier review format.
  - Reviews rollout schedule with CT Leader.
  - Initiates Top Focus entry requests as appropriate.
  - Executes Top Focus process as appropriate.
  - Develop Step down chart as appropriate.
- Supplier does the following:
  - Presents at CT meetings as required.
  - Develops, implements, and tracks action plans.
  - Provides regular updates to SQE.
  - Tracks and meets key performance metrics and monthly Step Down chart targets.
  - Establishes a GREEN rating on the CTBL.
- Supplier Leadership drives and documents systemic improvements in the organization and quality system.
- CT Leader provides all pre-RFQ's and Sourcing Recommendations to SQE prior to review at sourcing table.
- SQE reviews and approves all suppliers for Pre-RFQ's and follows all sourcing packages through the sourcing process.
  - Ensures non-green suppliers who will not be green by time of sourcing are not included in the Pre-RFQ.
  - All quality issues with non-green suppliers included in sourcing packages must be communicated immediately to the APQP manager, SPD manager, and CQI team leader / manager.
  - Presents business case for non-green suppliers to SQ Leadership for approval. (Move to Monitor and Check)

Monitor and Check Phase

- SQE reviews at least once a month:
  - CT rollout schedule with CT leader
  - Grow-Fix-Exit strategy with CT leader

- SQE reviews weekly:
  - Quality Status of all suppliers on the CTBL
  - Suppliers to be added/deleted on CTBL with CT leader
  - CT Quality Action Plans and progress to implementation of those plans
  - Status of specific suppliers action plans
  - All sourcing presentations (Pre-RFQ's, Updates, Recommendations, etc.) to ensure individual supplier's quality status is included
  - Sourcing status with CQI

Task Number: **5**

Task Name: **SQE Creativity Team Support**

Monitor and Check Phase (continued)

- SQE does the following as necessary:
  - Verifies non-green suppliers have implemented corrective actions.
  - Executes Step Down consequences.
  - Escalates lack of supplier progress to SQ and Supplier's leadership.
  - Initiates Top Focus exit request.
  - Shares best practices.

SQE Responsibility:

- Review performance data.
- Review rollout schedule with CT leader.
- Develop Grow-Fix-Exit strategy with CT leader.
- Develop CT quality action plans.
- Request detailed action plan from the supplier.
- Submit CTBL add/delete form to CQI group.
- Present CT quality performance at each CT meeting.
- Initiate Top Focus entry request.
- Execute Top Focus process as required.
- Track progress and review improvements for acceptability.
- Develop Step Down Chart.
- Execute Step Down consequences, as appropriate.
- Review all Pre-RFQ's and sourcing recommendation packages.
- Engage supplier leadership.
- Engage SQ and Purchasing leadership as required.
- Share best practices.
- Initiate Top Focus exit request.
- Escalate lack of supplier progress to SQ and Supplier's leadership.

Supplier Responsibility

- Leadership commitment and accountability.
- Drive and document systemic improvements in the organization and quality system.
- Develop, implement and track the action plan.
- Track and meet key performance metrics.
- Meet the monthly Step Down Chart targets.
- Establish a GREEN rating on the creativity team bid list.
- Provide regular updates to SQE as required.
- Present at CT meetings as required.

CT Leader Responsibility

- Review rollout schedule with SQE.
- Develop Grow-Fix-Exit strategy with SQE.
- Approve all suppliers for add/delete to the CTBL.
- Support quality performance goals and targets as established by SQ.
- Provide time on the CT meeting agenda for quality and supplier reviews.
- Review and provide to SQE all Pre-RFQs and Sourcing recommendation packages prior to review at sourcing tables.

Task Number: **5**

Task Name: **SQE Creativity Team Support**

Additional Information:

- GM Supply Power
  - Quad Report Update (GM 1927-71)
  - Supplier Quality Step down Chart (GM 1927-78)
  - CT Quality Action Plan (GM 1927-62)
  - CT Bid Lists
  - 6 Panel charts

* SQE herein refers to GM Supplier Quality Engineer or approved GM SQ Representative

Task Number: **6**

Task Name: **Global Emerging Issue /Alert Process**

Task Owner: SQ Representatives

Task Timing: Throughout the life of the product

Task Description: The purpose of the Global Emerging Issue / Alert Process is to implement standardized work for both the Supplier Quality Group and the GM supply base, specifically focused around communication and initial activities for emerging quality issues that may impact Manufacturing or Assembly Centers, or any other receiving locations in the same or other regions. The intent is to minimize potential impact of emerging issues through effective communication, containment activities, and established break points with certified product.

Criteria for Application:

- Part Quality Concerns that potentially impact the following areas:
    1) Quality Gates
    2) Audits – Global Customer Audit (GCA), etc.
    3) Direct Run Rate, Direct Run Loss, FTQ, verification stations
    4) C.A.R.E
    5) Excessive repair time
    6) Shipping yard on 'HOLD' status
- Warranty Issues/24hr CDP

Deliverables:

- Global Emerging Issue Alert (GM 1927-65)
- Conference call Schedule
- Certified Material/Break Points
- Controlled Shipping (if required)
- New Business Hold (if required)

Customer for Deliverables: GM Manufacturing, Assembly centers/SPO/other receiving locations, Supplier Quality

Necessary Inputs:	**Source of Input:**
Problem description	Assembly Center/SQ
Audits – Global Customer Audit (GCA) – if required	Assembly Center
Direct Run Rate, Direct Run Loss, verification stations – if required	Assembly Center
C.A.R.E. – if required	Assembly Center
Yard Hold – if required	Assembly Center

Resources: Supplier Management, *Supplier Quality Engineer/Supervisor, Reliability, Quality Engineering (if applicable), 3rd Party Provider (if applicable), PC&L/MSO (if applicable),

Methodology:

Assessment Phase

- An emerging issue is identified by the SQE. (Defined as a quality issue identified in a quality gate, audit, verification stations, etc. that has the potential of being classified as a spill or downtime.)
- The SQE immediately communicates the quality concern to the local supplier representative.
- The SQE determines potential severity and identifies appropriate stakeholders/resources.
- The SQE assesses whether any of the following situations exits:
    - Situation A: Supplier is located in the same region as all GM receiving locations

Task Number: **6**

Task Name: **Global Emerging Issue /Alert Process**

Methodology (continued):

- Situation B: Supplier is located in the same region as the detecting GM location, but ships to an additional GM location in another region
- Situation C: Supplier is located in different region from the detecting location

Implementation Phase

- For Situation A, the SQE contacts the supplier to immediately execute the following and complete/distribute the Emerging Issue Report:
  - Problem as seen by the user.
  - Translate issue into print or boundary specifications.
  - Establish sort criteria.
  - Understand potential root cause.
  - Understand scope of problem (when did it potentially start).
  - Method to certify material.
  - Establish break point and method to identify certified material.
  - Contain and certify the pipeline.
  - Notify receiving locations of certification ID and estimated time of arrival of certified material.
- For Situation B, the SQE follows activities for Situation A and also sends the Emerging Issue Report to the single point contact in the affected region (reference Cross Regional Support Matrix).
- For Situation C, the SQE follows activities for Situation A and also does the following:
  - Send the Emerging Issue Report to the single point contact in the region responsible for that supplier (reference Cross Regional Support Matrix.)
  - Set up a conference call with the supplier and the responsible SQE representative to execute the steps referenced in Situation A.
- SQE sets up subsequent conference calls to complete activities identified above.
- If appropriate an SQE is deployed to the Supplier's manufacturing location.

Monitor and Check Phase:

- Clearly understand the roles and responsibilities for subsequent tasks.
- Subsequent activities outside the scope of this task include:
  - Verify the break point is still intact
  - 5 Whys 3 Times analysis
  - Verification of root cause
  - Corrective Action
  - Additional process controls (error proofing, layered auditing, etc.)
  - Etc.

SQE Responsibility:

- Identify emerging issue.
- Communicate to local supplier representative.
- Determine severity of issue and identify stakeholders.
- Assess whether situation is either "A", "B", or "C".
- Complete a Emerging Issue Checklist and distribute
- Ensure supplier executes activities specified in "Situation A".
- Set up subsequent conference calls to complete activities.
- Travel to Supplier's Location (if required).
- Determine roles and responsibilities for subsequent tasks.

Global Current Process

Task Number: **6**

Task Name: **Global Emerging Issue /Alert Process**

Supplier's Responsibility:

- Communicate the Emerging issue to all affected Customer Locations.
- Execute activities specified in "Situation A".
- Attend all Conference calls as required.
- Participate in any/all follow up reviews/audits at the Supplying location.

Additional Information:

- Emerging Issue checklist.

** SQE denotes GM Supplier Quality Engineer, SQA, or approved GM SQ Representative.*

***Completion of the various activities in this task may require the collaboration of a number of SQEs. It is critical that these SQE's understand their roles and deliverables.*

7

Task Number: 7

Task Name: **Spill Prevention Activity**

Task Owner: GPSC – Current Supplier Quality

Task Timing: Throughout the life of the product

Task Description: The intent of this task is to drive proactive activity into selected suppliers to identify and minimize risk of emerging issues and spills through data analysis, process reviews, and leadership engagement.

Additional Description: The Spill Prevention Plan consists of the following elements:

- Zero Tolerance Bulletin
- Zero Tolerance Message
- Conference for selected suppliers
- On-site visit at selected suppliers consisting of the following:
  - Process Walk (PCPA) on highest risk process or product value stream
  - Dock Audit
  - Effective Root Cause Analysis (5 Whys 3 Times)
  - Verification of Corrective Action Implementation
  - Verification of lessons learned (PRR Read Across)
  - Execute appropriate actions and utilization of other Tools as appropriate
    - RPN Reduction Process
    - GP-12
    - CS1 and CS2

Criteria for Application:

- Historical Problem Suppliers
- Historical Problem Parts
- Suppliers who have had quality spills and/or emerging issues

Deliverables:

- Zero Tolerance Bulletin
- Zero Tolerance Message
- 5 Whys 3 Times Analysis (GM 1927-84)
- PRR Read Across (GM 1927-69)
- Dock Audit
- PCPA Audit (GM 1927-16)
- Supplier Risk Summary

Customer for Deliverables:
Creativity Team
GM Assembly/Manufacturing Plants
Supplier
Supplier Quality Management

Necessary Inputs:	**Source of Input:**
Supplier Performance data (6 panel charts, etc.)	Supply Power
PRR detail review	Supply Power / Supplier
GM Assembly/Manufacturing Plant metrics	Reliability Engineers
Internal / External Data Analysis	Supplier / SQE

Resources: Supplier Quality Engineer, GM Assembly Plant Personnel, and Supplier

Task Number: 7

Task Name: Spill Prevention Activity

Methodology:

Planning Phase

SQ Leadership does the following:

- Send a Zero Tolerance Bulletin to Suppliers via GM SupplyPower regarding spills.
- Select Suppliers for targeted spill prevention activity.
- Develop specific standardized work to ensure SQE's and selected suppliers understand expectations.
- Develop a tracking document for current status, issues identified, actions taken, and follow up required.
- Develop appropriate presentation material.
  - Zero Tolerance Message
  - Spill Prevention Plan
- Invite selected suppliers to Supplier Conference.
- Train SQE's relative to expectations and standardized work.
- Assign SQE's to selected suppliers.

SQE does the following:

- Review performance of assigned selected suppliers and identify parts/processes of high risk.
- Make arrangements to have supplier prepare 5Whys 3 Times and PRR Read Across for identified issues prior to SQE's visit.
- Make arrangements to have supplier review their Spill Prevention Plan during the SQE's visit.

Supplier does the following:

- Document the root cause of the identified issue on the 5 Whys 3 Times document. The 5 Whys 3 Times consists of the following:
  - Manufacturing – Why did the manufacturing process not prevent the defect from being produced?
  - Quality – Why did the quality process not detect the defect and prevent it from escaping the process?
  - Planning – Why did the planning process not predict and prevent the defect?
- Documents implementation of lessons learned by completing the PRR Read Across matrix.
- Updates their Spill Prevention Plan to:
  - Predict potential areas of risk by reviewing internal/external data.
  - Prevent the nonconformance through manufacturing controls.
  - Protect/detect the nonconformance by enhancing your quality system.

Implementation/Execution Phase

- Conduct Supplier Conference with Executive Leadership of Supplier.
  - Deliver Zero Tolerance Message: Reference example.
  - Review Spill Prevention Plan: Reference example.
  - Clearly present expectations, deliverables, and consequences.
- SQE does the following:
  - Conducts on-site visit of assigned suppliers.
  - Delivers Zero Tolerance Message.
    - Ensures an effective Root Cause Analysis (5 Why 3 Times) on selected issues/PRRs to ensure a thorough understanding of the root cause.
  - Conducts a Process Walk on highest risk process or product value stream to verify the following:
    - Operator Instructions/standardized work being followed.
    - Control Plan execution.
    - Error Proofing effectiveness and verification.
    - Corrective action implementation and effectiveness.
    - FMEA's, control plans, and operator instructions have been updated.
    - GP-12 or containment areas.

Task Number: **7**

Task Name: **Spill Prevention Activity**

Methodology (continued):

- Conducts a Dock Audit
    - For selected high-risk parts, review material that has been labeled and is ready to ship for possible defects. Referencing previous problems noted in PRRs is advisable.
    - Ensure that supplier has a routine process for doing dock audits.
- If concerns are identified, ensure appropriate actions are taken for the specific issues. This may include Supplier Action Plan, GP-12, or execution of Controlled Shipping Level 1 or Level 2.
- Completes a Supplier Risk Summary and provides to the SQ Leadership.

SQE Responsibility:

- Review performance of assigned selected suppliers and identify parts/processes of high risk.
- Ensure supplier prepares 5Why x 3 and PRR Read Across documents prior to SQE visit.
- Conduct on-site visit of assigned suppliers.
- Deliver Zero Tolerance Message.
- Review supplier's root cause analysis (5 Whys 3 Times).
- Review supplier's PRR Read Across analysis.
- Review supplier's Spill Prevention Plan.
- Conduct a process walk.
- Ensure appropriate actions are taken on identified issues.
- Completes a Supplier Risk Summary and provides to the SQ Leadership.

Supplier Responsibility

- Attend Supplier Conference.
- Participate in process walk and dock audit with SQE.
- Document root cause analysis (5 Why 3 Times) analysis and provide to SQE.
- Document the lessons learned on the PRR Read Across on similar parts/processes.
- Update their Spill Prevention Plan.
- Ensure appropriate actions are taken on issues identified by process review and dock audits.

Task Number: 8

8

Task Name: **Controlled Shipping Level 1 (CS1)**

Task Owner: Supplier Quality Engineer (SQE)

Task Timing: Current Production, response to Supplier quality concerns

Task Description: Controlled Shipping Level 1 is a demand by Customer that a supplier put in place a redundant inspection process at the supplying location to sort for a specific and specified nonconformance, implement a root-cause problem solving process, and isolate Customer from the receipt of nonconforming parts/material. The redundant inspection is in addition to normal controls, is enacted by the supplier's employees, and must be in addition to the normal production process controls.

Additional Description: The data obtained from the redundant inspection process is critical as both a measure of the effectiveness of the secondary inspection process and the corrective actions taken to eliminate the initial nonconformance.

Criteria for Application (any of the items below may be considered):

- Repeat PRR's
- Supplier's current controls are not sufficient to ensure conformance to requirements
- Duration, quantity, and/or severity of the problem
- Internal/External Supplier data
- Quality Problem in the field (i.e. PRTS, Warranty, JD Power)
- Major Disruptions
- SupplyPower bulletins

Deliverables:

- Certified Material to the Customer facility
- I-Chart (GM 1927-66) to demonstrate product quality (nonconforming vs. quantity checked)
- Documented and verified Corrective Action
- Additional process controls to prevent future occurrences
- Revised PCPs, PFMEA, Standardized work instructions as required
- Controlled Shipping Verification/Release/Exit worksheet (GM 1927-54) (optional)
- Controlled Shipping Level 1 Entry letter (GM 1927-55)
- Controlled Shipping Confirmation Reply Form (GM 1927-53)
- Corrective Action Report from supplier
- Controlled Shipping Level 1 Exit Letter (GM 1927-56)
- PRR Read Across (GM 1927-69), if required

Customer for Deliverables: Customer Assembly/Manufacturing Centers, SQE

Necessary Inputs:	**Source of Input:**
Problem Reporting and Resolution (PRR)	Mfg/Assembly Centers
Request for Entry into CS1	Mfg/Assembly Centers/SQE

Resources: Customer Plant Quality/Reliability Department, Customer Supplier Quality Engineer, Buyer, and supplier

Methodology:

Assessment Phase

- Customer Manufacturing/Assembly centers or SQE make a request for CS2, referencing the non-conformances/PRR's, observations at the supplier, the supplier's internal /external data, or other criteria for application.

Task Number: 8

Task Name: **Controlled Shipping Level 1 (CS1)**

Methodology (continued):

- SQE reviews the request/ documentation to ensure it complies with the criteria for application, and if applicable, makes the decision to place the supplier in CS1. This decision may also involve a SQ Manager.

Entry/ Implementation Phase

- SQE verbally notifies the supplier (staff level) they are being placed in CS1 and that a confirmation letter will follow.
- SQE sends formal confirmation to the supplier via a Controlled Shipping Level 1 Entry letter, addressed to the supplier's Top Management.
- SQE enters the CS1 record into GQTS based on the entry letter.
- SQE contacts the supplier (via conference call or meeting) to:
  - Review the non-conformance that resulted in the CS1 entry.
  - Review and approve the supplier's containment process which includes:
    - Data collection utilizing an I-chart.
    - Communication back to Customer (including frequency).
    - Control of non-conforming product.
  - Review and approve the supplier's escalation/reaction plan for the containment activity.
  - Establish boundary samples and/or specifications for acceptance/rejection of the parts.
  - Establish exit criteria for the CS1. Default criteria as follows:
    - 20 working days of data (from the date of implementation of permanent corrective action) which verifies that the normal production controls are effective for controlling the discrepancies identified in the Controlled Shipping activity.
    - Documentation showing the root cause was identified and verified.
    - Documentation indicating that corrective action was implemented and validated.
    - Copies of all documentation revised as required (Control plan, FMEA's, Process Flow, operator instructions, etc.)
    - Documentation indicating that every effort was taken to implement error proofing.
- SQE requests the support of the Customer buyer if the supplier is uncooperative in implementing CS1 to Customer's requirements.
- Supplier does the following:
  - Ensure understanding of the nonconformance.
  - Return confirmation letter as required.
  - Develop an escalation/action plan.
  - Immediately establish a separate containment activity area at their location that is acceptable to Customer.
  - Notify additional GM facilities that use the same part, inform them of the nonconformance, and provide containment activities as necessary.
  - Track breakpoints of nonconforming material. (Purge pipeline of suspect material, i.e. at Customer's facility, in transit and at all storage locations.)
  - Mark individual parts, material, and containers, as agreed upon by Customer, to identify parts certified for production.
  - Provide proper layout and instruction documents, space and tooling to perform Controlled Shipping - Level 1.
  - Commence the sort activities and display the results in a public and visible location.

- Buyer does the following:
  - If requested, intervene to support the SQE if the supplier is uncooperative in implementing CS1 per Customer's requirements.
  - Notify Purchasing Manager if intervention is required.

Task Number: 8

Task Name: **Controlled Shipping Level 1 (CS1)**

Methodology (continued):

Monitor and Check Phase

- Supplier does the following:
  - Perform a redundant inspection of all suspect non-conforming products per the agreed upon process and ensure defect free parts/material are delivered to Customer.
  - Determine and demonstrate the root cause to the Customer SQE (5 Whys 3 Times.)
  - Develop, implement and validate the permanent corrective actions, along with improved process controls (i.e., error proofing, layered audits, setup checklists, standardized work, operator training and certification program, etc.)
  - Implement lessons learned by conducting a PRR Read Across as required.
  - Conduct a daily management meeting at the sort location to review the results, ensure the corrective actions taken are effective, and plan required changes.
  - Update all applicable documentation, (i.e. Process Control Plan, PFMEA, Flow Diagram, and Standardized work Instructions etc).
  - Document containment data in I-chart format.
  - Communicate the action plan, inspection status, and results of problem resolution activities to the Customer in a format and with a frequency agreed to by the Customer representative.

- SQE does the following:
  - Monitor supplier's containment data (I-chart.)
  - Verify the supplier has a documented process control validation program in place (such as job setups, setup error proofing, process error proofing, layered auditing, operator training & certification etc.)
  - Verify supplier's root cause analysis and corrective actions.

Verification for Exit

- Supplier does the following:
  - Meet the defined exit criteria.
  - Request exit from Controlled Shipping - Level 1 and provide supporting documentation and assessments on performance and corrective actions to the appropriate Customer representative (Customer plant representative will be notified if required.)

- SQE does the following:
  - Conduct PCPA Audit, if applicable.
  - Verify that the supplier has met all exit criteria. The Supplier is removed from CS1 after all exit criteria are met and the established time has expired without further non-conformances at the Customer Assembly /Manufacturing Center, or coming out of the Supplier's process.
  - Notify the supplier verbally that they have met the criteria and that they will be removed from CS1 upon receipt of the CS1 exit letter.
  - Issue a Controlled Shipping Exit letter to the supplier for official notification that they have met the exit criteria.
  - Forward a copy of the exit letter to the Customer distribution. (Include CS Coordinator and GQTS Coordinator if applicable.)
  - Enter the exit information into GQTS.

Task Number: 8

Task Name: **Controlled Shipping Level 1 (CS1)**

SQE Responsibility:

- Confirm supplier's non-conformance and reviews their quality performance.
- Verbally notify the supplier's management of the non-conformance and entry into CS1.
- Communicate CS1requirements to the supplier (including exit criteria.) via conference call or meeting.
- Complete appropriate documentation for formal notification to the supplier.
- Verify and approve supplier's Controlled Shipping plan/process.
- Monitor supplier's containment data (I-chart).
- Verify supplier's root cause analysis and corrective actions.
- Verify the supplier's process control improvements and validation plan/frequency.
- Conduct PCPA audit, if applicable.
- Verbally notify the supplier's management of their removal from CS1.
- Complete appropriate documentation for formal notification of removal from CS1.
- Enter the exit information into GQTS.

Buyer Responsibility:

- If requested, intervene to support the SQE if the supplier is uncooperative in implementing CS1 per Customer's requirements.
- Notify Purchasing Manager if intervention is required.

Supplier Responsibility

- Ensure understanding of the nonconformance.
- Return confirmation letter as required.
- Develop an escalation / action plan.
- Implement a CS1 containment activity to ensure defect free parts/material are properly identified and delivered to Customer.
- Notify additional Customer facilities that use the same part and inform them of the nonconformance.
- Purge pipeline of suspect material.
- Conduct a daily management meeting at the sort location.
- Determine root cause.
- Develop, implement, and validate permanent corrective actions and process controls.
- Update all applicable documents.
- Document containment data in I-chart format.
- Communicate action plans, inspection status, and results of problem resolution activities to the Customer in a format and with a frequency agreed to by the Customer representative.
- Meet the defined exit criteria.
- Request exit from Controlled Shipping - Level 1 with appropriate supporting documentation.

Additional Information:
GP-5
Entry/Exit request from CS1

SQE in this document refers to the SQE, QSE, CS Coordinator, or other approved Customer Representative
SQ Manager in this document refers to a SQ Manager or other Customer Manager

Task Number: 9

9

Task Name: **Controlled Shipping Level 2**

Task Owner: Supplier Quality Engineer (SQE)

Task Timing: Current Production, response to Supplier Quality concerns

Task Description: Controlled Shipping is a Customer requirement to a supplier to put in place a 3rd party redundant inspection process to sort for a specific nonconformance, while maintaining Controlled Shipping Level 1, and implementing a root-cause problem solving process. The redundant inspection is in addition to normal controls and Controlled Shipping Level 1.

Additional Description: The 3rd party or a Customer representative will perform assessment audits. The data obtained from the 3rd party redundant inspection process as well as the audits are critical as both a measure of the effectiveness of the secondary inspection process and the corrective actions taken to eliminate the initial nonconformance.

Criteria for Application (any of the items below may be considered):

- Repeat PRRs
- Supplier's current controls are not sufficient to ensure conformance to requirements
- Duration, quantity, and/or severity of the problem
- Internal/External Supplier data
- Controlled Shipping Level 1 failures
- Major Disruptions
- Quality Problem in the field (i.e. PRTS, Warranty, JD Power)
- Supply Power bulletins

Deliverables:

- Certified Material to Assembly Plant
- I-Chart (GM 1927-66) to demonstrate product quality (nonconforming vs. quantity checked by a 3rd party)
- Documented and verified corrective action
- Revised PCP's, PMEA, Operator Instructions as required
- Controlled Shipping Assessment (GM 1927-52), Assessment Matrix (GM 1927-51), Supplier Action Report (GM 1927-79)
  (Completed by the Suppler, a 3rd party, or Customer representative)
- Controlled Shipping Verification/Release/Exit worksheet GM 1927-54 (optional)
- Kick-off Meeting Worksheet (GM 1927-59)
- Controlled Shipping Level 2 Entry Letter (GM 1927-57)
- Controlled Shipping Confirmation Reply Form (GM 1927-53)
- Controlled Shipping Level 2 Exit Letter (GM 1927-58)
- CSL2 Purchase Order Addendum, as required (GM 1927-60)

Customer for Deliverables: Customer Assembly/Manufacturing Centers, SQE

Necessary Inputs:	**Source of Input:**
Problem Reporting and Resolution (PRR)	Mfg/Assembly Centers
Request for entry into CS2	Mfg/Assembly Centers/SQE

Resources: Customer Plant Quality/Reliability Department, Customer Plant Supplier Quality Engineer, Buyer, Tier1 supplier, and 3rd Party Provider

Task Number: 9

Task Name: **Controlled Shipping Level 2**

Methodology:

Assessment Phase:

- Customer Manufacturing/Assembly centers or SQE make a request for CS2, referencing the non-conformances/PRR's, observations at the supplier, the supplier's internal /external data, or other criteria for application.
- SQE reviews the request/documentation to ensure it complies with the criteria for application, and if applicable, makes the decision to place the Supplier in CS2. This decision may also involve a SQ Manager.

Entry/Implementation Phase:

- The SQE verbally notifies the supplier that:
  - They are being placed on CS2.
  - Containment must be initiated immediately, in order to protect the customer.
  - Entry letter will follow.
  - They must contract an authorized 3rd party CS Provider.
  - SQE will be holding a kickoff meeting/conference call.
- SQE sends formal confirmation to the supplier via a Controlled Shipping Level 2 Entry letter, addressed to the supplier's Top Management.
- SQE enters the CS2 record into GQTS based on the entry letter.
- SQE and the Supplier complete a Kickoff Worksheet (if applicable) and agree on 3rd party provider.
- Supplier contacts a Controlled Shipping 3rd party and issues a purchase order for Controlled Shipping Level 2 activities within 24 hours of receiving the CS2 letter.
- Supplier returns confirmation letter.
- SQE and 3rd party provider hold a kickoff meeting or conference call with the Supplier's Quality Manager and Plant Manager to:
  - Review the non-conformance that resulted in the CS 2 entry.
  - Review and approve the supplier's containment process which includes:
    - Data collection utilizing an I-chart
    - Communication back to Customer (including frequency)
    - Control of non-conforming product
  - Review 3rd party provider actions/assessments as required.
  - Review and approve the supplier's escalation/reaction plan for the containment activity.
  - Establish boundary samples and/or specifications for acceptance/rejection of the parts.
  - Establish exit criteria for CS2.
  - SQE obtains signatures from Buyer and Supplier on CSL2 Purchase Order Addendum when required by the region.
- Supplier performs a redundant inspection of all suspect nonconforming products per the agreed upon process to ensure defect free parts (CS1).
- Supplier notifies additional Supplier facilities that use the same part, informs them of the nonconformance, and provides containment activities as necessary.
- The 3rd Party Provider performs an additional redundant inspection of all suspect non-conforming products per the agreed upon process to ensure defect free parts are delivered to Customer.
- If applicable, 3rd party Provider Quality Engineer or Customer SQE ~~to~~ reviews the Supplier's process and quality history, and completes the Assessment.

- SQE requests the support of the Customer buyer if the supplier is uncooperative in implementing CS2/and or supplying a PO number for 3rd party provider to Customer's requirements.
- Supplier submits irreversible corrective action plans to the ISO/TS16949 registrar for review and/or assessment and authorizes ISO/TS16949 registrar to submit the review and/or assessment findings to the Customer.

Task Number: 9

Task Name: **Controlled Shipping Level 2**

Methodology (continued):

- Buyer does the following:
  - If requested, intervene to support the SQE if the supplier is uncooperative in implementing CS2 and/or supplying a P/O# for 3rd party provider per Customer's requirements.
  - Notify Purchasing Manager if intervention is required.

Monitor and Check Phase:

- Supplier does the following:
  - Perform a redundant inspection of all suspect non-conforming products per the agreed upon process and ensure defect free parts/material are delivered to Customer.
  - Determine and demonstrate the root cause to the Customer SQE (5 Whys 3 Times).
  - Develop, implement and validate the permanent corrective actions, along with improved process controls (i.e., error proofing, layered audits, setup checklists, standardized work, operator training and certification program, etc.)
  - Document containment data in I-chart format.
  - Implement lessons learned by conducting a PRR Read Across as required.
  - Conduct a daily management meeting at the sort location to review the results, ensure the corrective actions taken are effective, and plan required changes.
  - Update all applicable documentation, (i.e. Process Control Plan, PFMEA, Flow Diagram, and Standardized work Instructions etc.)
  - Communicate the action plan, inspection status, and results of problem resolution activities to the customer in a format and with a frequency agreed to by the Customer representative.

- SQE does the following:
  - Monitor supplier's containment data (I-chart).
  - Verify the supplier has a documented process control validation program in place (such as job setups, setup error proofing, process error proofing, layered auditing, operator training & certification etc.)
  - Verify supplier's root cause analysis and corrective actions.

Verification for Exit:

- Supplier does the following:
  - Meet the defined exit criteria.
  - Request exit from Controlled Shipping - Level 2 and provide supporting documentation and assessments on performance and corrective actions to the appropriate customer representative. (Customer plant representative will be notified if required.)

- SQE does the following:
  - Conduct PCPA Audit, if applicable.
  - Verify that the supplier has met all exit criteria. (May be performed by the 3rd party.) The Supplier is removed from CS2 after all exit criteria are met and the established time has expired without further non-conformances at the Customer Assembly /Manufacturing Center or coming out of the Supplier's process.
  - Notify the supplier verbally that they have met the criteria and that they will be removed from CS2 upon receipt of the CS2 exit letter.

Task Number: 9

Task Name: **Controlled Shipping Level 2**

Methodology (continued):

- Complete a CS2 exit checklist (as required) and issue a CS2 exit letter to the supplier for official notification that they have met the exit criteria. (Distribute exit check sheet to any additional Customer resources who have responsibility for letter creation and distribution, if applicable.)
- Forward a copy of the exit letter to the Customer distribution. (Include any additional Customer resources who have GQTS update responsibility, if applicable.)
- Enter the exit information into GQTS.

SQE Responsibility:

- Confirm supplier's non-conformance and review their quality performance.
- Verbally notify the supplier's management of the non-conformance and entry into CS2.
- Verify and approve supplier's 3rd party provider selection.
- Hold kickoff meeting with 3rd party provider and supplier as specified in the Entry/Implementation phase.
- Complete appropriate documentation for formal notification to the supplier.
- Verify and approve supplier's Controlled Shipping plan/process.
- Monitor supplier's containment data (I-chart).
- Complete an Assessment and Assessment Matrix.
- Verify supplier's root cause analysis and corrective actions.
- Verify the supplier's process control improvements and validation plan/frequency.
- Conduct PCPA audit, if applicable.
- Verbally notify the supplier's management of their removal from CS2.
- Complete and distribute the appropriate documentation for formal notification of removal from CS2.
- Enter the exit information into GQTS.

Buyer Responsibility:

- If requested, intervene to support the SQE if the supplier is uncooperative in implementing CS2 and/or supplying a P/O# for 3rd party provider per Customer's requirements.
- Notify Purchasing Manager if intervention is required.

Supplier Responsibility

- Ensure understanding of the nonconformance.
- Develop an escalation / action plan.
- Contact and issue a purchase order to the Controlled Shipping 3rd party for Controlled Shipping - Level 2 activities. The supplier is responsible for all costs of the Controlled Shipping third party for the activity.
- Return confirmation letter.
- Implement a CS2 containment activity to ensure defect free parts/material are properly identified and delivered to Customer.
- Purge pipeline of suspect material.
- Notify additional Customer facilities that use the same part and inform them of the nonconformance.
- Submit irreversible corrective action plans to the ISO/TS16949 registrar for review and/or assessment.
- Authorize ISO/TS16949 registrar to submit the review and/or assessment findings to the Customer.
- Conduct a daily management meeting at the sort location.
- Determine root cause.

Task Number: 9

Task Name: **Controlled Shipping Level 2**

Supplier Responsibility (continued)

- Develop, implement, and validate permanent corrective actions and process controls.
- Update all applicable documents.
- Document containment data in I-chart format.
- Communicate action plans, inspection status, and results of problem resolution activities to the customer in a format and with a frequency agreed to by the Customer representative.
- Satisfy any and all additional requests noted on the CS2 Entry Letter and/or communicated during the Kick off meeting.
- Meet the defined exit criteria.
- Request exit from Controlled Shipping - Level 2 with appropriate supporting documentation.

Buyer Responsibility:

- Intervene to support the SQE if the supplier is uncooperative in implementing CSI per Customer's requirements.
- Notify Purchasing Manager if intervention is required.

3rd Party Responsibility:

- Participate/Lead the CS 2 Kick off meeting.
- Supply the required/agreed upon resources to perform the CS activity.
- Perform CS activity as contracted.
- Set up and verify conformance for all CS activity.
- Supply inspection results (I-chart) as required/requested.
- Complete Assessment, Assessment Matrix and a Supplier Action Report as required/requested.
- Conduct PCPA audit, if applicable.
- Verification that the Supplier's Root Cause, Corrective Actions, Process Controls, Process Documentation is updated and complete.
- Supply required documentation to the Customer SQE to meet the CS 2 requirements (as applicable).

Additional Information:

GP-5
Entry/Exit request from CS2

SQE in this document refers to the SQE, QSE, 3rd Party PQE, CS Coordinator, or other approved Customer Representative
SQ Manager in this document refers to a SQ Manager or other Customer Manager

10

Task Number: 10
Task Name: **Supplier Performance Review Meetings**

Task Owner: GPSC – Current Supplier Quality

Task Timing: Throughout the life of the product

Task Description: Formal meetings between the leadership of the Supplier and the leadership of GM to review the Supplier's quality performance and actions for driving improvement. This task describes 3 types of meetings, each with specific drivers, which engages leadership involvement to improve supplier performance.

Criteria for Application:

- **Supplier Performance Review** – focus is generally a supplier manufacturing Duns performance to a specific GM Assembly/Manufacturing plant. Attendance includes the GM Plant Support SQE and/or SQ Manager, the GM Plant Manager and/or Quality Manager, and the Supplier's General/Plant Manager and Quality Manager.
- **Supplier Quality Improvement Meeting** – focus is typically a supplier's ultimate Duns performance to GM. Attendance includes the GM Supplier Quality Director(s)/Group Director, GM Supplier Quality Manager(s), the Supplier's CEO/President, Corporate Quality Director, VP Manufacturing.
- **Spill Review Meetings** – focus is a spill caused by a supplier manufacturing Duns location. Attendance should include the GM Supplier Quality Director(s)/Group Director, GM Purchasing/Commodity Director and/or Manager, GM Creativity Team leader, GM Supplier Quality Manager(s), the Supplier's CEO/President, Corporate Quality Director, VP Manufacturing.

Deliverables:

- Supplier Action Plan (GM 1927-79)
- Agenda (GM 1927-76)
- Supplier Presentation

Customer for Deliverables: GM Assembly/Manufacturing Plant Quality
GM Supplier Quality Engineer/Manager/Director

Necessary Inputs:	**Source of Input**:
Supplier Performance Report (6 panel)	Supply Power
PRR Analysis Summary	Supply Power / GQTS
GM Assembly Plant/3rd Party quality data	Reliability Engineers /3rd Party
APQP	SQE
Launch	SQE
Supplier's Internal / External Data Analysis	Supplier / SQE

Resources: Supplier Quality, Purchasing, Supplier, GM Assembly Plant Personnel

Methodology:

Pre-Meeting Preparation

SQE does the following:

- Reviews 6-month PRR history, 6-panel charts, and other reports for targeted supplier to identify trends.
- Creates a Pareto for quality non-conformances to identify repeat issues and/or major causes of customer dissatisfaction**.**

Task Number: 10
Task Name: **Supplier Performance Review Meetings**

Methodology (continued):

Pre-Meeting Preparation (continued)

- Issue notification letter inviting the supplier to the meeting. (Suggested format)
- Prepare a presentation package for review at the meeting with:
  - Meeting agenda (suggested format)
  - Supplier Performance Report (6-panel)
  - Supplier's performance metrics to the GM Assembly/Manufacturing Plant(s).

Meeting

- SQE kicks off the meeting by presenting the agenda. The agenda should include:
  - Safety evacuation procedure
  - Participant introductions (an attendance list to be completed by all participants)
  - Intent and expectations
- SQE reviews the Supplier's performance and specific issues as appropriate (6 panel data, GM Plant impact)
- Supplier presents their information, which should detail:
  - Pareto analysis of their failures – locations, products, modes
  - Root cause analysis of failures, if applicable
  - Specific corrective actions to address the failures
  - Systemic changes to address poor performance
  - Propose a quality improvement glide-path with sufficiency plans
- If a spill meeting, SQE should also review the details of the spill and the impact on the GM plant.
- If a spill meeting, supplier also reviews the root cause, the failures in their process, and their corrective actions.
- SQE reviews any open cost recoveries.
- SQE should review open items, assignments, owners and follow-up dates.
- SQE should establish date for follow-up meeting, if necessary.
- After the Supplier has been excused from the meeting, GM participants evaluate the supplier's presentation and action plans, and determine next steps.

Monitor and Check

- Supplier drives and documents systemic improvements in the organization.
- Supplier develops, implements and tracks an action plan to resolve open issues.
- SQE conducts follow-up as required.
- SQE tracks progress, reviews improvements, and verifies implementation.

SQE Responsibility:

- Review and analyze Supplier Performance Report (6-panel) and Plant metrics.
- Issue notification letter to supplier.
- Summarize data into presentation format for the meeting.
- Kick off and facilitate the Performance review meeting.
- Present supplier's data at meeting (additional information is required for spill meetings).
- Document any open issues for follow-up from the meeting and review prior to closing the meeting.
- Schedule follow-up meeting, if necessary.
- Track progress, review improvements, and verify implementation.

Task Number: 10
Task Name: **Supplier Performance Review Meetings**

Supplier Responsibility:

- Provide leadership commitment and accountability.
- Present information at Performance Review meeting.
- Provide presentation, in electronic and hardcopy form.
- Drive and document systemic improvements in the organization.
- Develop, implement and track an action plan to resolve open issues.

Additional Information:

- Supplier Presentation

**** SQE denotes GM Supplier Quality Engineer or approved GM SQ Representative***

11

Task Number: 11

Task Name: **Executive Champion Process (ECP)**

Task Owner: GPSC – Supplier Quality

Task Timing: Throughout the life of the product

Task Description: The Executive Champion Process is used to improve the quality performance of the supply base, by driving systemic changes in manufacturing and quality through executive leadership engagement and accountability focused on clear expectations and metrics. The focus is on company or ultimate duns performance.

Criteria for Application:

- Companies with demonstrated poor performance over time
- Proactive continuous improvement activity for strategic suppliers

Deliverables:

- Mandatory Participation in ECP Conferences (Twice per year)
- Formal Entry and Exit to the Process
- Add/Remove Form (GM 1927-63)
- Executive Champion (EC) report out at GPSC staff meeting (Twice per year)
- Step Down Chart (GM 1927-78)
- Supplier Action Plans (GM 1927-79)
- Supplier Performance Report (6 Panel)
- On Site EC Visits to Key Supplier Duns Locations
- Key Metric Wall

Customer for Deliverables: GPSC, Supplier, Supplier Quality, Creativity Team.

Necessary Inputs:

	Source of Input:
Supplier Performance Report (6 panel)	Supply Power
Creativity Team Bid List	Creativity teams
PRR Analysis summary	Supply Power
Internal / External Data Analysis	Supplier/SQE/GM Mfg Center/APQP

Resources: Supplier Quality, Purchasing, Supplier, GM Assembly Plant Personnel

Methodology:

Assessment Phase

- ECP Add/Delete form is completed and submitted to Executive Champion Process/Top Focus (ECP/TF) Leadership Team.
- ECP/TF Leadership Team reviews necessary inputs as identified above to determine candidates for program.
- Review candidates with GPSC/SQ leadership for concurrence.
- Assign a GPSC Executive as the Executive Champion.
- Assign Single Point SQE to support GPSC EC.

Task Number: 11

Task Name: **Executive Champion Process**

Entry Phase

- GPSC Executive with the support of the Single Point SQE does the following:
  - Reviews all available data.
  - Contacts Supplier Executive to schedule face-to-face meeting to initiate the process. Recommended attendees: CEO, President, Corporate Quality Director, General Manager, Plant Manager.
  - Reviews the following materials with the supplier executives:
    - Executive Champion Process
    - Objectives and expectations
    - Supplier Performance Report (6 panel)
    - Creativity Team Bid List
    - Additional pertinent data from web site or other GM source (i.e. Warranty, Service Parts, etc.)
  - Initiates a Step-down Chart with the appropriate targets and consequences.
  - Develops a 24-hour key contact list for both the supplier and GM.
  - Develops a meeting cadence with supplier including on site visits and phone conferences.
  - Discusses potential roadblocks to success and identifies owners to remove.
  - Reviews exit criteria and exit process.

Implementation Phase

- GPSC Executive with the support of the Single Point SQE does the following:
  - Schedules and conducts an on-site review of most problematic Duns location.
  - Has the supplier establish an action plan (master dot process preferred), based on their internal data, external data, and any audits recommended by the Single Point SQE.
  - Reviews the action plan with the supplier's leadership and provide feedback.
  - Establishes a key metric wall displaying all critical ECP documents (6 panel, Step Down, Action Plans, etc.) in an area that can be viewed by workforce.

- Supplier does the following:
  - Performs a detailed analysis of their corporate quality metrics, including pareto analysis of the defect sources (manufacturing DUNS), the failure modes, the failure systemic root causes. These areas should become the focus of the Supplier's Action Plans.
  - Develops a Corporate Quality Improvement Plan, which includes specific quality action plans and initiatives to address the issues identified in the pareto analyses performed.
  - Develops sufficiency plans to address the quality gaps.
  - Develops a method to track implementation of the initiatives and resulting quality improvements.
  - Implements a lessons learned process across their Corporation using the PRR Read Across format.

Monitor Phase

- Track the supplier's progress with regular phone conferences and on site shop floor reviews.
- Supplier provides an update of the action plan and updated Step-down Chart a minimum of once a month with more frequent updates required initially at the discretion of the SQE. The plan is sent electronically to the EC.
- The EC and Single Point SQE conducts periodic performance reviews at the supplier facility reviewing the key metric wall, manufacturing process and discussing process control and error proofing improvements.
- Single Point SQE initiates the escalation of consequences as stated on the Step down Chart if targets are not met.

Task Number: **11**

Task Name: **Executive Champion Process (ECP)**

Methodology (continued):

Exit Phase

- Supplier meets all exit requirements including:
  - 50% improvement in PPM
  - Zero Spills for previous 6 months
  - 80% of individual Duns Green to Bid List
  - No Duns locations on New Business Hold
  - Demonstrated systemic improvement in process capability
  - All Action Plans closed
- Executive Champion completes the ECP/TF Add/Delete form and submits to ECP/TF Leadership Team.
- ECP/TF Leadership Team schedules EC into an exit review meeting where EC presents the case for graduation.
- Executive Champion presents the following supporting information to the ECP/TF Leadership Team.
  - Add/Delete form
  - Supplier Performance Report (6 panel)Creativity Team Bid List
  - Step-down chart
  - Systemic process capability improvement evidence
  - Action plans
- Once the graduation request has been approved, a graduation notification letter will be prepared and sent to the supplier by the ECP/TF Leadership Team.
- The graduating supplier will be formally recognized at the next scheduled Executive Champion conference.

SQE Responsibility:
In support of the Executive Champion:

- Review performance data.
- Support the Executive Champion with data analysis and on site visits.
- Support development of Stepdown Chart.
- Perform Audits as requested by Executive Champion.
- Track progress, review improvements and audit for acceptability.
- Execute Stepdown Consequences, as appropriate.
- Share best practices.
- Initiate controlled shipping to protect the GM Assembly Plants, when required.
- Engage SQ Manger/Supervisor if supplier improvement or commitment is lacking.

Supplier Responsibility

- Leadership commitment and accountability.
- Drive and document systemic improvements in the organization and quality system.
- Develop, implement, and track the action plan.
- Establish a “Key Metric Wall”.
- Track and meet key performance metrics.
- Meet the monthly Stepdown Chart targets.
- Establish a GREEN rating on the Creativity Team Bid List.

Task Number: **11**

Task Name: **Executive Champion Process (ECP)**

Additional Information:

- GM Supply Power
  - Quad Report Update (GM 1927-71)
  - Supplier Quality Step Down Chart (GM 1927-78)
  - Supplier Action Plan (GM 1927-79)
  - PCPA (Process Control Plan Audit) (GM 1927-16)
  - SFE (Shop Floor Excellence) (GM 1927-72)
  - FSA (Functional Supplier Assessment) (GM 1927-64)
  - QSB (Quality System Basics) - Task 2

12

Task Number: 12

Task Name: **Top Focus Process**

Task Owner: GPSC – Current Supplier Quality

Task Timing: Throughout the life of the product

Task Description: Top Focus is a process used to improve the quality performance of the supply base by utilizing audits, data analysis, and by driving systemic changes in the manufacturing and quality systems on the shop floor. The Process addresses systemic issues and is driven by supplier action plans and aggressive step down quality targets with consequences identified for failure to meet these targets. Leadership engagement, accountability, and escalation are key success factors.

Criteria for Application:

- Historically poor performing suppliers
- Negative impact on multiple GM Manufacturing/Assembly Centers based on quality metrics (major disruptions, high PPM, high PRRs, Direct Run Loss, and GCA)
- Proactive continuous improvement activity for strategic suppliers

Deliverables:

- Process Control Plan Audit (PCPA) GM 1927-16
- Shop Floor Excellence (SFE) Audit GM 1927-72
- Top Focus Process Notification Letter (Optional) GM 1927-83
- Top Focus Add/Remove Form (Optional) GM 1927-82
- Quad Report (GM 1927-71)
- Step Down Chart (GM 1927-78)
- Supplier Action Plans (GM 1927-79)
- Quality System Basic (QSB) Training (Optional)
- Functional Supplier Assessment (FSA) if necessary GM 1927-64
- Supplier Performance Assessment Matrix - SPAM (optional) GM 1927-80
- Key Metric Wall

Customer for Deliverables: Supplier, Supplier Quality, Creativity Team.

Necessary Inputs:	**Source of Input:**
Supplier Performance Report (6 panel)	Supply Power
Creativity Team Bid List	Supply Power
PRR Analysis Summary	GQTS
Supplier's Internal Data Analysis	Supplier

Resources: Supplier Quality Engineer, Buyer, Supplier

Task Number: 12

Task Name: **Top Focus Process**

Methodology:

Assessment Phase

SQE does the following:

- Reviews "Necessary Inputs", as identified above, along with feedback from GM manufacturing centers, Launch teams, and APQP Group.
- Identifies potential systemic issues.
- Contacts the supplier's quality manager/director to schedule an audit.
- Conducts a Process Control Plan Audit (preferred in the assessment phase.)
- Conducts a Shop Floor Excellence Audit (preferred in the assessment phase.)

Entry/Implementation Phase

SQE does the following:

- Initiates a Quad Report to summarize and clearly state
  - The Problem
  - Actions Taken to Date
  - Expectations and Exit Criteria
- Requests approval, from appropriate manager/director, to place the supplier in Top Focus by submitting the following:
  - Top Focus Add/Remove Form (Optional)
  - 6 panel chart
  - Creativity Team bid list
  - Quad Report
  - PCPA and SFE if completed in the assessment phase
  - Notification letter
- Once approved, places the supplier into Top Focus and sends the supplier's management a "Top Focus Process Notification Letter" (optional).
- Initiates a Step Down Chart with the appropriate consequences.
- Conducts a kick-off meeting with GM SQ /Purchasing Leaderships and the supplier's top management (recommended attendees: CEO, President, Corporate Quality Director, General Manager, Plant Manager) to review the following:
  - Top Focus Process
  - Potential Systemic Issues
  - Clear objectives and expectations for the next 6-8 months
  - Quad report
  - Step down chart and escalation process
  - Metric Wall expectations
  - Commitment and engagement by supplier's executive leadership
  - Exit criteria

  Note: The Kick-off meeting is a critical step in the Top Focus Process. Ensuring understanding of expectations and consequences and obtaining commitment from the supplier leadership will ensure success of the activity.
- Schedules and conducts a PCP Audit and a Shop Floor Excellence Audit (if not completed in the assessment phase).
- Has the supplier establish an action plan, based on their internal data, external data, PCPA, SFE and SQE observations.
- Conducts FSA (if necessary).
- Conducts a QSB Workshop (Optional). The SQE may conduct this workshop or direct the supplier to contract with a 3rd party.
- Reviews the action plan with the supplier's leadership and approves/ provides feedback.

Supplier does the following:

- Commits resources and participates in QSB Workshop (as requested).

Task Number: 12

Task Name: Top Focus Process

Methodology (Continued):

- Supplier does the following:
  - Performs a detailed analysis of their manufacturing Duns quality metrics, including Pareto analysis of the defect sources (manufacturing process or product line), the failure modes, the failure systemic root causes. These areas, along with the GM Audits performed, should become the focus of the Supplier's Action Plans.
  - Develops a Manufacturing Duns Quality Improvement Plan, which includes specific quality action plans and initiatives to address the issues identified in the Pareto analyses performed.
  - Develop sufficiency plans to address the quality gaps.
  - Develops a method to track implementation of the initiatives and resulting quality improvements.
  - Implements a lessons learned process across their Corporation using the PRR Read Across format.
- Conducts deep dives into FMEAs and Control Plans as necessary. These deep dives would require appropriate process, product, and material experts from the supplier. SQE participation is preferred, but optional

Monitor and Check Phase

- SQE tracks the supplier's progress with regular on site shop floor reviews, as required.
- Supplier provides an update of the action plans a minimum of once a month. More frequent updates may be required initially at the discretion of the SQE. The plan is posted on GM SupplyPower.
- SQE posts an updated Stepdown Chart, a Quad Report, and recent audits monthly. (Documentation is posted on GM SupplyPower for NAVO, US, and Canada)
- The SQ Manager/Supervisor conducts periodic performance reviews with the supplier, as required, to support the SQE.
- SQE initiates the escalation of consequences as stated on the Stepdown Chart if targets are not met.
- At the three to four month interval evaluate if the supplier is on target to graduate within a six to eight month window. If not on target, notify the manager/director that the supplier is a candidate for external top focus (3rd party).
- Supplier implements and maintains a continuous improvement process.

Verification for Exit

- Supplier has met all exit requirements as stated on the Quad Report.
  - 50% improvement in PRRs, PPM
  - No spills within the last 6-month period
  - Green on the quality section of the Creativity Team Bid List.
  - Improvement is the result of specific identifiable improvements and sustained over a period of time. (Typically 2 to 3 months after the targets have been met.)
- SQE verifies effectiveness of corrective actions.
- Supplier completes the Supplier Process Assessment Matrix (SPAM) (Optional).
- SQE requests removal, from the appropriate manager/director, by submitting the following:
  - Top Focus Add/Remove Form (Optional)
  - 6-panel chart
  - Creativity Team Bid List
  - Stepdown chart
  - SPAM (optional)
  - Quad report
  - Systemic improvement summary
  - Action plan
  - Exit notification letter
- Once the exit request has been approved, SQE notifies the supplier and issues the exit notification letter.

Task Number: 12

Task Name: **Top Focus Process**

SQE Responsibility:

- Review performance data.
- Initiate Top Focus entry request.
- Develop Quad Report and Stepdown Chart.
- Perform Audits.
- Track progress, review improvements and audit for acceptability.
- Execute Stepdown Consequences, as appropriate.
- Share best practices.
- Initiate controlled shipping to protect the GM Assembly Plants, when required.
- Engage supplier leadership.
- Engage SQ and Purchasing leadership as required.
- Initiate Top Focus exit request.

Supplier Responsibility

- Leadership commitment and accountability.
- Drive and document systemic improvements in the organization and quality system.
- Develop, implement, and track the action plan.
- Establish a "Key Metric Wall".
- Track and meet key performance metrics.
- Meet the monthly Stepdown Chart targets.
- Establish a GREEN rating on the Creativity Team Bid List.
- Provide completed SPAM (optional).

Additional Information:

GM Supply Power

- Quad Report Update (GM 1927-71)
- Supplier Quality Step Down Chart (GM 1927-78)
- Supplier Action Plan (GM 1927-79)
- PCPA (Process Control Plan Audit) (GM 1927-16)
- SFE (Shop Floor Excellence) (GM 1927-72)
- FSA (Functional Supplier Assessment) (GM 1927-64)
- QSB (Quality System Basics)
- Top Focus Process Notification Letter (GM 1927-83)
- Top Focus Exit Letter
- Top Focus Training

**** SQE denotes GM Supplier Quality Engineer or approved GM SQ Representative***

13

Task Number: 13

Task Name: **New Business Hold / Exit**

Task Owner: GPSC – Current Supplier Quality

Task Timing: Throughout the life of the product

Task Description: New Business Hold is a process to prohibit the supplier from quoting new business. Exit is the process of re-sourcing all business from the supplier.

Criteria for Application:

- Confirmed supplier spill
- Unauthorized process or tool change (resulting in major disruption)
- Repeat major disruptions (Downtime, stockouts)
- Consequence on Step Down Chart
- Outcome of Supplier Performance Meeting
- Lack of ISO/TS16949 certification (unless waived by procuring division)
- Poor performance over time
- Ongoing Customer Satisfaction PRR's
- Continued poor Service Parts Delivery Index (SPDI) rating

Deliverables:

- New Business Hold status on Creativity Team Bid List
- New Business Hold record in GQTS

Customer for Deliverables:
Buyer
Creativity Team
GM Assembly/Manufacturing Plants
Supplier
Supplier Quality Management

Necessary Inputs:	**Source of Input:**
Quad Report (GM 1927-71)	SQE
APQP / Launch Issues	SQE
Creativity Team Bid List	SupplyPower
Internal / External Data Analysis	SupplyPower/ SQE
PRR Analysis Summary	Supply Power / SQE
Step Down Chart (GM 1927-78)	SQE
Supplier Action Plan (GM 1927-79)	Supplier
Supplier Performance Report (6 Panel)	SupplyPower
Warranty data	SQE

Resources:
Buyer
Supplier
Supplier Quality Engineer

Task Number: **13**

Task Name: **New Business Hold / Exit**

Methodology:

Entry into NBH

- SQE creates/updates Quad Report, gathers supporting documentation, and submits to local management for approval. (If a single point SQE is assigned to the supplier, they should initiate the Quad.)
- SQ Manager sends a notification to GPSC Commodity Manager and CQI Manager to advise them that a New Business Hold request is being initiated and their support is requested.
- SQE finalizes Quad Report for distribution and ensures:
  - Header information is correct
  - Problem is clearly stated and that New Business Hold or Exit is clearly stated
  - Actions taken are clearly stated
  - Exit criteria are clearly stated (requirements that must be met by supplier to be removed from NBH). This may require alignment with Purchasing. (There may be no exit criteria if the decision is to Exit the supplier.)
- SQ Manager/Director review and approve Quad report.
- SQE submits Quad report to GPSC NBH Coordinator, CQI Manager, and CQI Group Leader to schedule a review at the next International Commodity Sourcing Table meeting.
- GPSC NBH Coordinator summarizes all NBH requests and distributes via Lotus Notes to the NBH distribution.
- CQI Group Leader presents New Business Hold request at the next International Commodity Sourcing Table meeting.
- Upon approval, the GPSC NBH Coordinator gathers appropriate executive signatures, communicates internally, inputs the NBH status into the Global Quality Tracking System (GQTS), and issues an official NBH notification letter to the Supplier.
- If sourcing table rejects, decision should be appealed to Executive Director of Supplier Quality.
- GPSC Commodity Manager or Creativity Team Leader determines how the supplier will be notified of the New Business Hold initiation. It is recommended that this be done as part of a Spill or SQIM meeting.
- Regionally assigned SQ resource verifies that the supplier notified the QS/TS Registrar of New Business Hold status.

Exit from NBH

- SQE monitors supplier's progress to ensure exit criteria are being met.
- When exit criteria have been met, the SQE updates the Quad Report with supporting documentation.
- SQ Manager sends a notification to GPSC Commodity Manager and CQI Manager to advise them that a New Business Hold removal is being initiated.
- SQE or Manager finalizes Quad Report for distribution.
- SQ Manager/Director review and approve Quad.
- SQE submits a copy of the Quad Report to the GPSC NBH Coordinator CQI Manager, and CQI Group Leader to schedule a review at the next International Commodity Sourcing Table meeting.
- CQI Group Leader presents NBH removal request to sourcing table for official buy-in and communicates results to the GPSC NBH Coordinator.
- Purchasing Commodity Manager or Creativity Team Leader determines how the supplier will be notified of the New Business Hold removal.
- GPSC NBH Coordinator gathers appropriate executive signatures, communicates internally, inputs the NBH status into the Global Quality Tracking System (GQTS), and issues an official NBH notification letter to the Supplier.

Task Number: 13

Task Name: New Business Hold / Exit

SQE Responsibility:

- Initiate Quad Report and supporting documentation.
- Obtain SQ Management approval for request
- Support, as necessary, presentation at Sourcing Table.
- Follow up, as necessary, with the supplier to ensure exit requirements have been met.
- Initiate removal request after supplier meets exit criteria.

Supplier Responsibility

- Meet exit criteria as required.
- Notify registrar of New Business Hold entry and exit.

Additional Information:

Creativity Team Exit Process
New Business Hold Training
"Leveraging the Registrar Training"

**** SQE denotes GM Supplier Quality Engineer or approved GM SQ Representative***

Advanced Product Quality Planning (APQP)
Global Process

Revision History
January, 2004

Section #1 Tasks 1-17

Task 1 *Commodity Sourcing Strategy Meeting*—Under "Necessary Inputs" added warranty. Under "Methodology" section added types of warranty data to discuss at meeting. Under "Methodology" section added more information on PSA requirements and scoring method. Under "SQE Responsibility" section added that Part Specific SOR needs to be included in RFQ. Under "Additional Information" added AIAG QSA and Data sources for Warranty.

Task 2 *Technical Reviews*—"Under Necessary Inputs" eliminated Complex Systems/Subassemblies. Under "Methodology" section added Part Specific SOR to lessons learned review. Under the "SQE Responsibility" section added supplier understanding of Part Specific SOR. Under the "SQE Responsibility" section removed the word "recommended" that was listed next to the supplier understanding of SQ SOR. Under "Supplier Responsibility" section replaced "IPTV" with "warranty goals and expectations" and added warranty sufficiency plans.

Task 3 GPSC APQP Assessment & Sourcing—Under "Necessary Inputs" removed "QSA" reference to eliminate confusion (PSA and QSA are the same document). Under the "SQE Responsibility" section modified the follow-up requirements to correspond with changes to the GPSC APQP Assessment changes.

Task 4 *Supplier Gate Reviews*—Under "Deliverables" section removed sentence that referenced the Complex Systems appendix. Under "Methodology" section removed sentence from each Gate Review that referenced APQP Program management Complex Systems. Replaced "QWIK" with "Warranty Reduction Plans". In Supplier Gate Review #3, removed reference to GM 1927-23M. Under "SQE Responsibilities" section added Part Specific SOR to lessons learned requirement.

Task 6 *Feasibility and Manufacturing Assessment Letters*—"Methodology" section, added GM Engineer as a recipient of Letters 2-4. Removed sentence that described letter as a formal transfer of responsibility from supplier's engineering to supplier's manufacturing organization.

Task 8 *DFMEA*—Under "Necessary Input" section replaced "criteria checklist" with "Part Specific SOR". Under the "Methodology" section added "high severity items" to DFMEA flow chart box.

Task 10 *Gage, Tooling and Equipment Reviews*—under "SQE Responsibility" section added sentence to verify the existence of GM owned tooling and that it is properly identified as GM property.

Task 11 *GP-11 Pre-Prototype and Prototype*—Under "Methodology" section added "or equivalent" to requirement that supplier's must ensure subcontractors follow GP-11. Under "Supplier Responsibility" section replaced "GM 1826-2" with "GP-11 Corrective Action Plan"

Task 12 *PFMEA*—Under "Necessary Inputs" section added Part Specific SOR to lessons learned input. Under "Methodology" section added "high severity items" to PFMEA box. Added "customer complaints, and internal data for the life of the part" to box that describes revision drivers. Under "SQE Responsibility" section added high severity failure modes to action plan requirement. Under "Supplier Responsibility" section add requirement for formal documented RPN reduction process, activity through the life of the part, subcontractor's involvement, and periodic reviews.

Task 13 *Control Plans*—Changed "may' to "should" for use of AIAG Control Plan format in the Definition section. Under the "Supplier Responsibility" section added requirement for layered audits and daily validation of error proofing. Also added review of subcontractor control plans.

Task 14 *Early Production Containment (GP-12)*—Under "Definition" section added GP-12 applicability whenever mandated by GM on any parts that present significant risk to a customer plant. Under "Methodology" section add requirement for separate inspection area, irreversible corrective action, and 100% check.

Task 16 *Run @ Rate (GP-9)*—Under "Necessary Inputs" changed "Quoted" to "Contracted" tooling capacity. Under "Methodology" section added that SQE may decide to participate in sub-component Run @ Rate, as appropriate. Under "SQE Responsibility" changed "regional database" to "system" in the bullet referencing where to status customer-monitored Run @ Rates. Under "Supplier Responsibility" section removed "supplier monitored" from bullet referencing the status of Run @ Rates. Under "Additional Information" section removed wording regarding 2001 edition of GP-9. Under "Methodology", SQE Responsibility", and "Supplier Responsibility" sections added a reference to GM 1960-C1, C2, C3.

Task 17 *Lessons Learned*—Under "Deliverables" added Part Specific SQ SOR updates. Under "Methodology" section changed "Key Stakeholders" to "Commodity Sourcing Strategy" meeting. Added references to Part Specific SQ SOR's. Under "Supplier Responsibility" section moved error-proofing validation to Task 13.

Appendices

Appendix 1	Complex Systems/Sub-assemblies APQP Management Plan	Moved Document Usage Guidelines to the beginning of the APQP manual and made Complex Systems Appendix 1.
Appendix 2	Data Sources for Warranty	Moved Complex Systems/Sub-assemblies APQP Management Plan to Appendix 1 and made Data Sources for Warranty Appendix 2.

Revision History
May, 2005

Section #2

Task 1 *Program Risk Assessment* – Title changed from "*Cross Functional Risk Assessment*"; enhanced *task description*, *methodology* and *deliverables* to be more descriptive of process; added *customer(s) for deliverables*

Task 2 *GP/SQA Launch Team Resource Plan Development* – Title changed from GPSC/SQA Launch Team Staffing; Changed task owner for Launch Leader to Launch Director; enhanced *task description* and *methodology* to be more descriptive of process; added *customer(s) for deliverables;* clarified *task owner responsibility*

Task 3 *Global Launch Matrix* – Changed task timing to reflect actual publication process; enhanced task description and methodology to be more descriptive of process; added customer(s) for deliverables; updated data processing flow chart

Task 5 *Daily Launch Issue Escalation Process – Former task 5 Launch Issue Escalation Process and task 6 Conference Calls combined to reflect practice*

Task 6 *Pre Launch Conference* – Title changed from *GPSC Executive Supplier Days (Pre-Launch Conference);* enhanced *task description*, *methodology* and *deliverables* to be more descriptive of process; added *customer(s) for deliverables*

Task 7 Boundary Sample Review – Enhanced task description, methodology and deliverables to be more descriptive of process; added customer(s) for deliverables; include updated Boundary Sample RASIC Chart

Task 11 *Problem Solving Process* – Enhanced methodology to be more descriptive of process; included references to GM Problem Solving Processes in Additional Information

Appendix 2 – Data Sources for Warranty

Legend Legend updated to correctly show Internal and External versus GM only sources.

Revision History
November, 2006

Task 5 *Daily Launch Issue Escalation Process – Former task 5 Launch Issue Escalation Process and task 6 Conference Calls combined to reflect practice*

Task 6 *Pre Launch Conference* – Title changed from *GPSC Executive Supplier Days (Pre-Launch Conference);* enhanced *task description*, *methodology* and *deliverables* to be more descriptive of process; added *customer(s) for deliverables*

Task 7 *Boundary Sample Review – Enhanced task description, methodology and deliverables to be more descriptive of process; added customer(s) for deliverables; include updated Boundary Sample RASIC Chart*

Task 11 *Problem Solving Process* – Enhanced methodology to be more descriptive of process; included references to GM Problem Solving Processes in Additional Information

June, 2007

Various *Changed references to QS900 and Quality Characteristics to match current terminology.*

Revision History
September, 2008

Section #1 Tasks 1-17

Task 1 *Commodity Key Stakeholders Meeting*—Task Name changed from Commodity Sourcing Strategy Meeting to *Commodity Key Stakeholders Meeting*; Task Description, Key Deliverables, Necessary Inputs and Methodology changed to meet GVDP 5.0 and Engineering & Advanced Purchasing Sourcing Process

Task 2 *Technical Reviews*— Task Description, Key Deliverables, Necessary Inputs and Methodology changed to meet GVDP 5.0 and Engineering & Advanced Purchasing Sourcing Process; Task 3 was integrated to this Task

Task 3 GPSC APQP Assessment & Sourcing was removed and integrated to Task 2;
SQ NOD 004 was incorporated into the manual at this Task

Task 4 *Gate Reviews*— Task Name changed from Supplier Gate Reviews to Gate Reviews. Task Time, Description, Key Deliverables, Necessary Inputs and Methodology changed to meet GVDP 5.0 and Engineering & Advanced Purchasing Sourcing Process; PPAP and Run @ Rate Reviews were introduced; The APQP Supplier Status Workbook GM1927-34 was introduced to support Gate Reviews execution

Task 6 *Feasibility and Manufacturing Assessment Letters* —Was removed
QSB —Was transferred from Current Section to APQP Section and updated

Task 7 *Process Flow Charts* — Task Description, Key Deliverables, Necessary Inputs and Methodology changed to meet GVDP 5.0

Task 8 *DFMEA*— Task Description, Key Deliverables, Necessary Inputs and Methodology changed to meet GVDP 5.0 and introduction of DRBFM activity

Task 10 *Tooling and Equipment Reviews* — Task Name changed from Gage, Tooling and Equipment Reviews to Tooling and Equipment Reviews; Gage activity was removed and transferred to Task 11; Task Description, Key Deliverables, Necessary Inputs and Methodology changed to meet GVDP 5.0

Task 11 *GP-11 Pre-Prototype and Prototype* — Was Removed.
Gage Development And Approval — Was Removed from Task 10 and transferred to this Task in order to introduce the complete methodology to support the application of GM1925 (Checking Fixture Standard for purchased parts).

Task 12 *PFMEA* — Task Description, Key Deliverables, Necessary Inputs and Methodology changed to meet GVDP 5.0

Task 13 *Control Plans* — Task Description, Key Deliverables, Necessary Inputs and Methodology changed to meet GVDP 5.0 and Powertrain requirements

Task 14 *Early Production Containment (GP-12)* — Task Description, Key Deliverables, Necessary Inputs and Methodology changed to meet GVDP 5.0

Task 16 *Run @ Rate (GP-9)* — Complete methodology update

Task 17 *Lessons Learned*— Complete methodology update

Appendices

Appendix 1	Complex Systems/Sub-assemblies APQP Management Plan	Removed
Appendix 2	Data Sources for Warranty	Removed

Glossary of Terms

Glossary of Terms

AAR: Appearance Approval Report

A/D/V: Analysis/Development/Validation

A/D/V–DV: ADV Design Validation

A/D/V P&R: Analysis/Development/Validation Plan and Report. This form is used to summarize the plan and results for validation testing. Additional information can be found in the GP-11 procedure.

A/D/V–PV: ADV Product Validation

AIAG: Automotive Industries Action Group, an organization formed by General Motors, Ford and Daimler-Chrysler to develop common standards and expectations for automotive suppliers.

AP: Advance Purchasing

APQP: Advanced Product Quality Planning

APQP Project Plan: A one-page summary of the GM APQP process that describes the tasks and the timeframe in which they occur.

AQC: Attribute Quality Characteristic

ASQE: Advanced Supplier Quality Engineer

BIW: Body in White. Usually the bare metal shell of the body including doors and deck lid prior to paint and trim.

BOM: Bill of Materials

BOP: Bill of Process

Brownfield Site: An expansion of an existing facility.

CMM: Coordinate Measuring Machine

Cpk: Capability Index for a stable process

CTC: Component Timing Chart (DRE document)

CTS: Component Technical Specifications

CVER: Concept Vehicle Engineering Release

Defect outflow detection: A phrase used in the Supplier Quality Statement of Requirements that refers to in-process or subsequent inspection used to detect defects in parts.

DFM/DFA: Design for Manufacturability / Design for Assembly

DFMEA: Design Failure Modes and Effects Analysis. It is used to identify the potential failure modes of a part, associated with the design, and establish a priority system for design improvements.

DPV: Defects per vehicle

DR: Documentation Required

DRE: Design Release Engineer

DV: Design Validation

E&APSP: Engineering & Advance Purchasing Sourcing Process.

Error Occurrence Prevention: A phrase used in the Supplier Quality Statement of Requirements that refers to poke yoke or error-proofing devices used to prevent errors in the manufacturing process from occurring.

FTQ: First Time Quality

GA: General Assembly

GD&T: Geometric Dimensioning & Tolerancing

GM: General Motors

GMAP: General Motors Asian Pacific

GME: General Motors Europe

GMNA: General Motors North American

GP: General Procedure

GPDS: Global Product Description System

GPS: Global Purchasing System

GPSC: Global Purchasing & Supplier Chain

GQTS: Global Quality Tracking System

GR&R: Gage Repeatability and Reproducibility

Greenfield Site: A new supplier facility that is built to support a program.

GVDP: Global Vehicle Development Process

IPTV: Incidents per Thousand Vehicles

IVER: Integration Vehicle Engineering Release

KCC: Key Control Characteristics. It is a process characteristic where variation can affect the final part and/or the performance of the part.

KCDS: Key Characteristic Designation System

Kick-Off Meeting: The first APQP supplier program review.

KPC: Key Product Characteristic. It is a product characteristic for which reasonably anticipated variation could significantly affect safety, compliance to governmental regulations, or customer satisfaction.

LAAM: (General Motors) Latin American, Africa & Meddle East

LCR: Lean Capacity Rate. It is the GM daily capacity requirement.

MCR: Maximum Capacity Rate. It is the GM maximum capacity requirement.

MOP: Make or Purchase

MPC: Material Production Control

MPCE: Material Production Control Europe

MRD: Material Required Date; date material must be delivered in order to allow a build event to begin.

MSA: Measurement Systems Analysis

MU: Mock-Up. Mock-ups can be actual functioning parts, sub-assemblies or assemblies or non-functional wood, expanded polystyrene, plastic or metal representations of parts, subassemblies or assemblies. The design source can be responsible for providing mock-ups.

MVBns: Manufacturing Validation Build non-saleable

MVBs: Manufacturing Validation Build saleable

NBH: New Business Hold

N.O.D.: Notice of Decision

OEM: Original Equipment Manufacturer

PAD: Production Assembly Documents

PC&L: Production Control & Logistics

PDT: Product Development Team

PFMEA: Process Failure Modes and Effects Analysis. It is used to identify potential failure modes associated with the manufacturing and assembly process.

PPAP: Production Part Approval Process

Ppk: Performance index for a stable process

PPM: 1) Program Purchasing Manager, 2) Parts per Million (rejects and returns to suppliers)

PPV: Product & Process Validation

PQC: Product Quality Characteristic

PR/R: Problem Reporting & Resolution

PSA: Potential Supplier Assessment, a subset of the Quality System Assessment (QSA)

PV: Product Validation

QSA: Quality System Assessment

QSB: Quality Systems Basics

QTC: Quoted Tool Capacity

RASIC: Responsible, Approve, Support, Inform, Consult

R@R: Run at Rate

RFQ: Request For Quotation

RPN: Risk Priority Number related to FMEA development

RPN Reduction Plan: An action plan that describes what is being done to reduce the risk priority number for items listed in the DFMEA or PFMEA.

SDE: Supplier Development Engineer

SFMEA: System Failure Mode and Effects Analysis

SMT: System Management Team

SOA: Start of Acceleration

SORP: Start of Regular Production

SOR: Statement of Requirements

SPC: Statistical Process Control

SPO: (General Motors) Service and Parts Operations

SQ: Supplier Quality

SQE: Supplier Quality Engineer

SQIP: Supplier Quality Improvement Process

SSF: Start of System Fill

SSTS: Sub-system Technical Specifications

Sub-Assembly / Sub-System: An assembly of sub-components delivered to the GM main production line for installation to the vehicle as a single unit.

Subcontractor: The supplier of a sub-component to a Complex System/Subassembly supplier (Tier 2, 3, etc).

SVE: Sub-System Validation Engineer

SVER: Structure Vehicle Engineering Release.

Team Feasibility Commitment: An AIAG APQP form that is provided with the Request for Quotation. It is the supplier's concerns with the feasibility of manufacturing the part as specified.

TKO: Tooling Kick-Off

UG: Unigraphics

VLE: Vehicle Line Executive

VTC: Validation Testing Complete

WO: Engineering Work Order