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GM Advance Product Quality Planning

GM's vision is to Design, Build, and Sell the World's Best Vehicles, in order to do that we must have a robust plan. That plan must include great designs, great manufacturing processes and great quality systems. We have learned that the critical points to a successful quality system are communication and standardized work. The purpose of this manual is to communicate GM's expectations and provide standardized work during the product development cycle.

This manual is intended as a supplement to the AIAG Advance Product Quality Manual, which provides the framework and detail for good advance quality planning. The manual is designed to help GM personnel and suppliers understand the expectations specifically related to GM launches.

In order to help support GM's vision, the planning process has been split into four reviews, Valve A, Valve B, 'who, what, and when' for each of the review. Each procedure includes standardized work showing the requirements, escalation options, referenced documents, and methodology behind each task.

Work Instructions

The following are the work instructions for the task requiring a status of Red, Yellow, or Green. They are intended to show the SQE and Supplier what the 'ideal' state for each task is. The ultimate goal is to reach the 'ideal' state for each task in order to support program timing for delivering a quality part by the required PPAP date. Deviations from the 'ideal' state are listed in the work instructions. The appropriate category shall be selected and loaded into GQTS by the supplier regardless if the part(s) are statused as Supplier or Customer Monitored. If the part(s) are statused as Customer Monitored, the SQE will approve the supplier's submission. A worksheet (GM1927-34) has been provided for the SQE and supplier to use as a summary sheet. Also, included in the work instructions are Resources and References, regional documentation requirements, and suggested methodologies to help the team achieve the required content.

Valve A

General Requirements

Timing:

- Valve A is targeted to be completed three (3) weeks prior to Tool Kick-Off (TKO). TKO is modity specific and is based on the official program timing template generated through the Program Timing Office.
- The individual tasks shall be cadenced appropriately from sourcing to the Valve A event. See Appendix A for recommended cadence of events.

Ownership:

- All events (Valve A, Valve B,) shall be coordinated by the supplier within put from SQE.
- Valve A shall be attended at a minimum by:
 - Supplier: Program Management, Quality, Manufacturing, and Engineering
 - GM: SQE, Design Release Engineer, and Purchasing
 - Optional attendees: Dimensional Engineering, GD&T group, and Appearance Engineer

Deliverables:

- A supplier kick-off meeting shall be conducted at a ward of the business. The GM1927-14 should be used as a reference and best practice for the meeting agenda and content discussion. GM SQE shall communicate program timing deliverables at that time. The suppliers shall maintain a contact list for each program over the life of the program. The list shall include at a minimum: Name, Position, Cell Phone, email, 24-hour contact, and escalation priority (i.e. who should be called 1st, 2nd, etc) for all necessary supplier personnel.
- Each program shall have one open issues list that includes all program issues; this would include, but is not limited to, all commercial, design, engineering, quality and manufacturing issues.
- APQP specific timing items shall be maintained on one overall program management timeline with additional program critical information such as timing for tooling, testing etc.
- Red, Yellow, or Green status shall be identified for each item listed per Appendix A and documented according to GM1927-34 in the APQP module.

Design Review

- Engineering has confirmed that math data is released and is accessible to supplier.

- Math data and related files include all appropriate notes on other necessary items such as materials, test specifications, software requirements, etc.
- Released engineering data has been pared to the SOR/SSTs and CTS; all discrepancies have an adequate action plan for resolution.
- Supplier to confirm availability of the math data and notes and has confirmed feasibility for production.
- Key Characteristic Designation System (KCDS) meeting is scheduled or has been completed
- Supplier to review GD&T documentation for the following:
 - The datum schemes are consistent with both product use and process intent.
 - Plans for gage development are consistent with the datum scheme.
 - Tolerances are understood and verified achievable by the supplier.
 - In cases of new technology or tighter tolerances than historically achieved, an action plan is needed to monitor the progress of capability performance throughout the process development phase.
- Escalation Drop Downs
 - G—Adequate math data and GD&T released—Supplier has confirmed feasibility
 - Y—Adequate design data not available—recovery plan in place
 - Y—Datum or tolerances not agreed to—recovery plan in place
 - Y—Feasibility not confirmed—recovery plan in place
 - Y—KCDS not completed but scheduled
 - R—Adequate design data not available—recovery plan not in place
 - R—Datum or tolerances not agreed to—recovery plan not in place
 - R—Feasibility not confirmed—recovery plan not in place

Commercial Issues

- Supplier received piece price and tooling contract to the latest available level of Math Data
- Supplier has received tooling PO
- SQE to verify that supplier has no additional commercial issues, i.e. issues with directed-buys, suppliers pricing, etc.
- Escalation Drop Downs
 - R—No tooling PO
 - R—Additional commercial issues
 - Y—Contracts need to be updated
 - G—No commercial issues

Plant Layout and Process Flow

- Plant Layout

- Supplier to provide current plant layout for the entire facility including planned areas where new program will be housed, the shipping, receiving, inventory, suspect/scrap material hold areas, etc.
- Supplier to provide detailed view of area where program will be housed, if applicable should include cell configuration, in-process & finished goods inventory area, scrap area, etc.
- GMSQ should review layout to make sure there are no concerns, i.e. overlapping work and finished goods storage, if there are issues supplier needs to provide a plan to address/control
- Process Flow
 - Supplier to provide a diagram for production and pre-production process both should include shipping, receiving, and rework, and should coordinate with the PFMEA and Control Plan; preliminary diagrams should include GP-12
 - Process flows should include every operation within the process of making this part in accordance with the AIAG APQP and Control Plan Manual
- Escalation Drop Down
 - R—Supplier does not have a plan/space to house the new program
 - Y—Supplier has to move existing program to house new program
 - G—Supplier has no issues with housing new program

DFMEA

- General Requirements
 - Supplier has done all necessary design analysis for part and tool manufacturability, i.e. mold flow analysis, tool material hardness, etc, for the particular modality
 - Supplier has applied the DFMEA to all relevant areas
 - Supplier & GM have reviewed all warranty issues and incorporated all corrective actions into the DFMEA
 - Supplier has evaluated the design to determine if potential failures will be addressed via process control or the assembly equipment
- GM—Design Responsible
 - Supplier has worked with GMDRE to build DFMEA
 - Supplier has reviewed the DFMEA corresponding to the current design from the GMDRE
- Supplier—Design Responsible
 - Supplier has reviewed the SOR/SSTS and CTS for all design, governmental, reliability, appearance, serviceability, and any other applicable requirement and incorporated into DFMEA
 - Supplier has reviewed the latest AIAG FMEA Edition and applied all applicable requirements

- Supplier has considered all influences the awarded part has on mating parts and the influence of mating parts on the awarded part and incorporated into DFMEA
- Supplier has provided the DFMEA corresponding to the current design to the GMDRE and the DFMEA is approved by the GMDRE
- Escalation Drop Down
 - G—DFMEA Complete to current EWOGM responsible
 - G—DFMEA Complete to current EWOSupplier responsible
 - R—DFMEA Not Complete to current EWOGM responsible
 - R—DFMEA Not Complete to current EWOSupplier responsible

Lessons Learned and Warranty

- Supplier has reviewed all similar products across all vehicles, OEMs, and manufacturing facilities and incorporated all information into Lessons Learned document or database; information can be from customer complaints, in-house quality reviews, GP-12, warranty complaints, GMSORs, GM Process Specific Audits, etc.
- Supplier has used information from Lessons Learned and incorporated into the control plan, PFMEA, DFMEA, operator instructions, and all other applicable areas; if supplier is not design responsible they should inform product engineering of any important information
- Supplier has a procedure to address warranty issues, should include how warranty returns are handled, contact info for key personnel, protocol for how potential warranty issues are communicated to the customer, steps as to how corrective action is fed back to lessons learned database, control plan, PFMEA, etc.
- Escalation Drop Downs
 - R—
Supplier has no Lessons Learned database or Warranty Issues procedure and has no plan for one
 - Y—
Supplier has no Lessons Learned database or Warranty Issues procedure and has plan for one
 - Y—
Supplier has Lessons Learned database and Warranty Issues procedure and has not incorporated information
 - G—
Supplier has Lessons Learned database and Warranty Issues procedure and has incorporated information

Gage and Tooling Equipment Review

- General Requirements
 - Supplier has received toolable P-released, or at a minimum T-released, math data; if T-released there should be a recovery plan for P-released math
 - Supplier has received final contracted part GD&T and reviewed tolerances with hMSQE, DE, and Dimensional Engineer and in agreement
 - If assembling, supplier has ponent part GD&T
 - Supplier has reviewed and agreed to all SQ Part Specific SORs for gage and tooling requirements, should have been done prior to sourcing
 - Supplier has done all necessary design analysis for part and tool manufacturability, i.e. mold flow analysis, tool material hardness, etc, for the particularmodity
- Tooling Review Requirements
 - Supplier has ensured that all Part or SQ SOR tooling requirements areprehended in the tooling equipment plan and has clearly defined all tooling equipment function and verified that all SOR requirements are satisfied
 - Supplier has prehendeda ll ponent and assembly GD&T into assembly equipment
 - Supplier has provided error proofing plan for equipment, process flow, PFMEA, and PCP and documents are approved by SQE; For VAA suppliers, approval needed from SQE and Manufacturing Engineer
 - Supplier has provided timing chart detailing equipment build, shipment, set-up timing, expected date of first shots, PPAP, ; equipment timing is to include all line items required for the part to meet all fit, finish, and function requirements
 - Supplier has pleted and returned all relevant process specific audits, answers are to be based on what will be incorporated in the tooling equipment
- Gage Review Requirements
 - Supplier has set-up and conducted an initial design review with the gage source, meeting attendees should at minimum include the GMDE, SQE, and craftsmanship engineer; for VAA the manufacturing engineers should be invited as well
 - Discussion for meetings should include points where any KPCs or PQC spots will be placed on the gage
 - Supplier will set-up and conduct a 90% pleted design review at the gage source, at a minimum meeting attendees should include the GMDE, SQE, and craftsmanship engineer; for VAA the manufacturing engineers should be invited as well; SQE to approve gage design

- Supplier has ensured that all GD&T requirements are capable of being checked or engaged by some feature, and where not being checked by a feature suppliers shall provide a plan as to how the requirement will be verified
- Supplier has provided timing for gage completion and level if gage build is staged
- Escalation Drop Downs
 - G—Tooling Design complete
 - G—Gage design complete
 - Y—Tooling design not complete; no impact to PPAP target
 - Y—Gage design not complete; no impact to PPAP target
 - R—Tooling design not complete; impact to PPAP target
 - R—Gage design not complete; impact to PPAP target

Validation and ADVP & R

- Requirements for supplier-responsible validation are clearly communicated by GM to the supplier. Normally the se are located in Statement of Requirements Appendix G1 GMW3600 and Appendix G2. Additional requirements may be documented on drawing or in math data (DCS file log).
- Supplier understands and is in agreement as represented by ADVP&R submission.
- ADVP&R is approved by GM Validation Engineer and Lead Engineer.
- Supplier to ensure the materials used for ADVP&R correspond to the DCS File Log
- Testing and final report, GM1829, will be complete in time for PPAP approval.
- ADVP&R should include plan to validate the maximum allowable regrind percentage per the material spec
- Escalation Drop Downs
 - G—SOR and design record requirements complete
 - G—SOR and design record requirements accepted by supplier
 - G—ADVP&R approved
 - R—SOR and design record requirements not complete
 - R—SOR and design record requirements not accepted by supplier
 - R—ADVP&R not approved

PFMEA and Error Proofing

- The supplier has adequate design information to conduct PFMEA activities
- The supplier has a Pre-production PFMEA based on the design release and historical Best Practices information of similar products/processes
- The supplier has identified unique aspects of the current design not covered by historical Best Practices, and prepared initial PFMEA activities on those new items
- PFMEAs are across-functional activity
- PFMEAs have been reviewed by the appropriate authority for reasonableness

- PFMEA information is included in the packages to the potential tooling sources for reflected processes.
- The supplier has reviewed assembly PFMEAs and identified relevant issues to communicate to the various Tier 2 component suppliers
- Potential tooling sources and Tier 2 Suppliers have previously demonstrated an understanding of the potential failure modes and how to compensate for them in the process design
- Escalation Drop Downs
 - G—PFMEA across functional activities in place
 - Y—PFMEAs need additional GM input to proceed
 - Y—PFMEAs need additional supplier work
 - Y—PFMEAs need communication to Tier 2 or Tooling Suppliers
 - R—PFMEAs not complete or communicated—recovery plan not in place
 - R—PFMEA not being used

Process Control Plan

- Suppliers should base Pre-production Process Control Plan (PCP) on Pre-production PFMEA
- Supplier to ensure that PCP includes all requirements from the AIAG APQP & Process Control Manual
- Pre-production PCP to be reviewed and approved by cross-functional team, team should include a minimum of GMSQE and DE
- Supplier ensure that all Key Product Characteristics (KPCs) and Product Quality Characteristics (PQC) are treated appropriately
- Suppliers should include error proofing plan to be incorporated into Pre-production PCP
- Supplier ensure gages are referenced as needed in Pre-production PCP
- Suppliers should include all applicable GM or Supplier required Lot Acceptance Testing, Part Specific QSORs, and Process Specific Audits requirements or recommendations in Pre-production PCP
- Suppliers should ensure all learnings from internal read-across activities are included in Pre-production PCP
- Suppliers should ensure all process testing from Part SOR, SSTS/CTS, GMW specs and DSC File Logs are included in Pre-production PCP
- Escalation Drop Downs
 - G—Pre-production Process Control Plan peted and risk appropriately
 - Y—Pre-production Process Control Plan peted and not risk appropriately
 - R—Pre-production Process Control Plan not peted
 - R—Supplier new tomodity

Dimensional Plan

- Supplier completely understands GM requirements for dimensional data submissions throughout program, i.e. Prototype, Matching, PPV, NS, etc.
- Key Characteristic Designation System (KCDS) meeting is scheduled or has been completed
- Supplier Dimensional Plans should include:
 - All Key Product Characteristics (KPCs), Product Quality Characteristics (PQCs), or critical manufacturing dimensions from the GD&T and statistical capability requirements for KPCs or PQCs
 - Critical manufacturing dimensions should include all DTS points
 - A plant to support dimensional measurements for first required parts, plant to include staffing, variable measurement data collection method, i.e. CMM, Laser or White Light Scan, etc.
 - Part Road Map for what areas/points are required for variable data collection above any KPC or PQC and what points/areas are attributed data collection
 - Plant to repair/rework out-of-spec condition exists (if possible)
 - All dimensional measurement requirements from applicable SQ Part Specific SOR
- If required, dimensional status of prototype is known
- Escalation Drop Downs
 - G—Dimensional Plan complete, no issues
 - G—Supplier understands requirements and has successfully done in the past
 - Y—Supplier has not supported GM dimensional plan requirements in the past, possibly need training
 - Y—KCDS not completed but scheduled
 - R—Supplier has no plans/resources to support dimensional submission requirements

Materials/DCS File Logs

- Supplier has verified that all ISOR and GD&T requirements are reflected in the design record
- All stakeholders completely understand materials requirements and callouts in the design record
- Suppliers should plan to validate the maximum regrind amount per the material spec for PPAP approval
- Supplier has contracted all materials and identified GM-approved sources where required
- Supplier has resources to PPAP materials suppliers
- Escalation Drop Downs
 - G—
Material requirements are called out in the design record(s) and understood
 - Y—
Material callouts are present in the design record, but approved source not identified yet
 - R—Material callouts are required, but not present in the design record yet
 - R—GM-approved source does not yet exist for required material

Design Appearance Quality

- Supplier has received and clearly understands the latest level Design Appearance Requirements (DAR) document for grain and material specifications
- Supplier has received and understands all required testing for appearance related validation, such as APOPS, Solar testing, Mat Spec, etc., and has developed a plan to complete all testing on time for PPAP
- Supplier has received and understands Grain Instruction Form/Process
- Supplier has reviewed the design to understand how the design and supplier's process will affect the final appearance in respect to the GM requirements listed in the DAR and has raised any concerns (For example, a plastic part supplier has reviewed mold flow to understand where knit lines will be and if that is acceptable to GM requirements)
- Escalation Drop Downs
 - G—DAR Latest Level Received
 - G—Appearance related validation testing complete
 - G—Tooling Design complete proper Draft Identified for Grain
 - Y—Tooling design not complete proper draft identified; no impact to PPAP target
 - Y—Test identification has not been completed; no impact to PPAP target
 - R—DAR not received at latest level
 - R—Tooling design not complete; impact to PPAP target
 - R—Test identification has not been completed; impact to PPAP target

- R— AppearanceRelatedValidationtestingnotpleteforrequiredfullPPAPdate

Containerization

- SupplierhasbeenincontactwiththeGMContainerizationengineerandGMDREandworkingoniningandoutgoingpackagingdesign,includingfootprintanddunnagewhereapplicable,ifthecontainersarereturnablesorexpendablesforbothiningandoutgoingcontainers
- SupplierhasbeenincontactwiththeGMContainerizationengineerandhasplanandtimingforwhentheoutgoingshippingcontainerswillbeavailableandtheamountsforeachbuild;timingplanshouldincludewhenallcontainerswillbeavailable,howmanycontainerswillbeavailableateachbuild,
- Suppliershallprovideproductionpartsforallshippingtrialsaspartofcontainervalidation,shouldbeincludedintiming&buildplan
- Suppliershouldhaveadesignforexpendablepacksandtimingforallvalidationtestingofpacks,designshouldbeapprovedbytheGMDREandContainerizationEngineer
- Supplierhasmaintenanceplanwhichincludesstorage,handling,andcleaningforcontainersstoensureracksareproperlymaintainedthroughoutthelifeoftheprogram
- EscalationDropDowns
 - G—NoContainerIssues,designontrack
 - R—PrototypeContainer—Nodesign
 - Y—PrototypeContainer-Designissues
 - Y—Preliminarydesigninprocess
 - R—GMContainerEngineernotidentified
 - R—Containersnotinprocess

Tiered Supplybase

- ThesupplierhasconfirmedleadtimeforallTieredsupplierrequirements;Plansareadequatetosupportprogramtiming
- ThesupplierhasadequateSupplierQualityproceduresandresourcesinplace,inaccordancewiththeirmodityrequirements
-
- TieredsupplieritemsthatareeitherDirected-BuyorApprovedSourceListitemshaveaclearagreementbetweenthesupplierandGMastoAPQPcoverageresponsibilities
- TierlhasverifiedTieredSuppliermanufacturingfeasibilityandreceiveddocumentationstatingso
- TierlhasreviewedandapprovedtheTieredSupplier'spreliminaryPMFEA,assemblyequipmenterrorproofing,andallapplicableGMpartspecificaudits

- KCDS/PassThruCharacteristics must be reviewed by GMDRE/SQE to verify control method at tiered suppliers and in inspection at Tier 1
- Escalation Drop Downs
 - G—Tiered Supplier' s plans are in place and adequate
 - Y—Tiered Supplier' s plans are not adequate, but recovery plans that support program timing are in place
 - R—Tiered Supplier' s plans are not adequate, and recovery plans that support program timing are not in place

PPAP

- PPAP plans have been discussed by the supplier and the individual SQE responsible for approving the PPAP. Both parties have an understanding and a documented agreement of expectations for both content and timing.
- The plans should target Full PPAP Approval prior to the Vehicle MVBSMRD.
- If this supplier is a Tiered Supplier (such as in Directed-Buy arrangements), adequate timing is in the plant to allow the Tier 1 supplier to complete PPAP prior to the Vehicle MVBSMRD.
- Open issues affecting the completion of PPAP on time are documented and have an action plan.
- Issues that do not have a clear plan for success of on-time PPAP have already been escalated for management assistance.
- Escalation Drop Downs
 - G—Plans in place for on-time PPAP
 - Y—Plans in place, but need close monitoring to ensure on-time PPAP
 - R—No plans for PPAP in place
 - R—Plans in place, but PPAP timing at serious risk
- Supplier clearly understands expectations regarding the purpose of the I411 in the PPAP process
- Supplier clearly understands all program deliverables for PPAP (validation, dimensional, etc.) and is aware that all issues must be documented on the I411 at the time of the first PPAP submission
- Supplier has access to AIAG manual and forms for PPAP
- Escalation Drop Downs
 - G—Supplier understands requirements and has successfully completed I411 in the past
 - Y—Supplier has not completed I411 forms before, but understands requirements
 - Y—Supplier does not have access to AIAG documents, but has plan
 - R—Supplier has no understanding of I411 requirements & requires training

- GMPurchasinghasprovidedContractedDailyCapacity(LCR)demanddatatothesupplierforeachawardedpart
- GMPurchasingandthesupplierhaveagreedondailyoperatinghoursthatwillbeusedtomeetContractedDailyCapacityrequirements
- Thesupplierhaspreparedcapacityplanningfilesshowingexpectedprocesscycle times, number of tooling sets, and machine capacity loads, and any shared capacity with other program regardless of OEM
- The capacity planning data shows adequate coverage of Contracted Daily Capacity requirements
- If multiple tool sets or machines will be phased in overtime for staged increases in capacity, the plans and timing requirements are documented
- , per GP-9 requirements
- Escalation Drop Downs
 - G— Contracted Daily Capacity, operating hours, and capacity plans are documented and show adequate coverage
 - Y— Contracted Daily Capacity requirements are not adequately covered, but a recovery plan is in place to ensure coverage
 - Y—
 - R— Contracted Daily Capacity requirements are not documented
 - R— Contracted Daily Capacity requirements are not covered by current plans, and an adequate recovery plan is not in place
 - R— The supplier has not performed capacity planning for these parts

GP-12

- ThesupplierisknowledgeableaboutGP-12activitiesandrequirements.
- ThesupplierhasidentifiedwhethertheseGP-12activitiesaretobedevelopedoffsimilarproductsthathavebeenpreviously launched, or whether new GP-12 activities need to be developed.
- Appropriate timelines have been established.
- Escalation Drop Downs
 - G— Supplier knowledgeable about GP-12
 - Y— Supplier needs training on GP-12— plan in place
 - R— Supplier not committed to GP-12

QSB

- If Supplier is QSBpliant and GM has verified then no further action required
- If supplier is **not**pliant, then

- Suppliers should have QSB materials and completely understand GM requirements
- Suppliers should complete a QSB self-assessment using the GM QSB Audit located on Supply Power, formulate a gap analysis to the requirements, and an action plan to address and discrepancies, GM SQE to review and approve self assessment audit and action plan
- Supplier has prioritized timing plan for implementation of each QSB Section, SQE to approve
- Supplier timing should include the minimum implementation requirements for Valve Band full QSB implementations should be complete by end of supplier launch
- Escalation Drop Downs
 - G—Supplier has completed 1st QSB self-assessment
 - G—Supplier is QSB compliant and GM has verified
 - G—Supplier is Yellow to QSB requirements with plan for compliance prior to SOP
 - Y—Supplier is Yellow to QSB with no plan for compliance prior to SOP
 - R—Supplier has not completed 1st QSB self-assessment

Valve B

General Requirements

Timing:

- Valve B event is timed to be completed three weeks prior to first PPV or N/Sevent. GA parts would be three weeks prior to Matching 1; all other parts will be three weeks prior to PPV.
- Individual tasks shall be cadenced appropriately from Valve A to Valve B. See chart Appendix A for recommended cadence of events.

Ownership:

- Valve B shall be coordinated by supplier with input from SQE
- Valve B shall be attended at a minimum by:
 - Supplier: Quality, Dimensional group, Engineering and Manufacturing
 - GM: SQE, DRE, Dimensional Engineering
 - Optional Attendees: Matching Coordinator, Purchasing, Paint & Polymers

Deliverables:

- Suppliers shall provide all the documentation for a Level 5 PPAP submission per the AIAG PPAP Manual. Any deviations preventing Full PPAP approval shall be documented on GM 1411 with supporting attachments.
- Dimensional reports, initial capability studies, DOE results shall be available for review with GMSQ.
- Initial Gage R&R' s shall be available for review.
- Production operator training plan and timings shall be reviewed.
- Matching required parts shall meet GMW10067.
- Contact lists should be re-verified.
- Open issues list should be up to date
- Supplier Program timings should be reviewed.
- Red, Yellow, or Green status shall be identified for each item listed per Appendix A and documented according to GM-1927-34 in the APQP module.

Design Review

- Math data is updated for all released EWO activity.
- GM Engineering and the Supplier have a tracking plan for any remaining EWO activity.
- Remaining EWO change activity can be contained within program timing requirements.
- Gage R&R studies and early vehicle builds have shown that GD&T plans are sufficient.

- In the case of new technology or tighter than historical tolerances, adequate progress has been made to have a feasible design with satisfactory capability at Full PPAP.
- Escalation Drop Downs
 - G—EWO activity up to date with no pending changes putting on-time PPAP at risk
 - Y—Material not up to date—recovery plan in place
 - Y—
 - Significant changes under consideration that could put PPAP timing at risk
 - Y—Datum or tolerance concerns—recovery plan in place
 - R—EWO activity has PPAP preparation late to program requirements
 - R—Datum or tolerance concerns—recovery plan not in place

Commercial Issues

- Review supplier timing plan to ensure supplier has received all EWOs driven addendum to PO to continue the flow of tool modification and completion
- Make sure Quoted Tool Capacity (QTC) is greater than the Contracted Daily Capacity (LCR) and is reflected in Contract; SQE to reference Global Tooling Letter for current program Contracted Daily Capacity, link below:
- Any open commercial items have been captured in Action Items list and are reviewed regularly at program review meetings
- Escalation Drop Downs
 - R—No tooling PO for EWOs
 - R—QTC less than Program Contracted Daily Capacity
 - G—No commercial issues

Plant Layout and Process Flow

- Plant Layout
 - Supplier to provide updated plant layout, GMSQE should review provided layout to make sure it's accurate
 - Verify all issues from Valve A review have been addressed with either a corrective action or are in process control plan
 - If there has been a plant reconfiguration then suppliers should re-evaluate Valve A and GMSQE to verify
- Process Flow
 - Supplier to provide updated production and Pre-production process flow and GMSQE to verify all operations are captured
- Escalation Drop Down
 - R—Supplier does not have space to house new program
 - G—No issues housing new program

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