1.0 SCOPE:

1.1 The intent of this procedure is to define the method for communicating, resolving, and documenting various types of supplier concerns and the process for evaluating the effectiveness and efficiency of the actions taken; including cost tracking and formal resolution. (Quality, Delivery, Warranty and PPAP)

1.2 This procedure applies to corrective actions in response to supplier non-conformance and customer concerns if affected as well as actions taken to prevent the repeat of non-conformances.

1.3 This procedure applies to all external suppliers of TI Automotive including customer directed suppliers. This is a global procedure and applies to all Divisions of TI Automotive.

2.0 RESPONSIBILITIES:

2.1 The Process Owner is the Global Corporate Purchasing Director.

2.2 All TI Automotive personnel initiating supplier concerns are responsible to ensure that it is communicated to the appropriate Manager or designee.

2.3 The Regional Division Leaders or designees are responsible for monitoring the closure of the corrective action activity according to the requirements of this procedure.

2.4 The Quality Manager / or designee is responsible for managing supplier **Quality** concerns, coordinating corrective actions, timely communication from the supplier/affected personnel and maintenance of records and correspondence logs related to supplier concerns. In the event the supplier concern affects a TI Automotive Customer; the Quality Manager will be responsible for managing the customer concern.

2.5 The Materials / Logistics Manager / or designee is responsible for managing supplier **Delivery** concerns, coordinating corrective actions, timely communication from the supplier/affected personnel and maintenance of records and correspondence logs related to supplier concerns. In the event the supplier concern affects a TI Automotive Customer; the Quality Manager will also be responsible for managing the customer concern

2.6 The Warranty Manager / or designee is responsible for managing supplier **Warranty** concerns, coordinating corrective actions, timely communication from the supplier/affected

personnel and maintenance of records and correspondence logs related to supplier concerns. In the event the supplier concern affects a TI Automotive Customer; the Quality Manager will also be responsible for managing the customer concern.

2.7 Purchasing and Plant Quality are responsible for managing supplier **PPAP** concerns, coordinating corrective actions, timely communicating and correspondence from the supplier/affected personnel and maintenance of records and correspondence logs related to supplier concerns. In the event the supplier concern affects a TI Automotive Customer, the Quality Manager will also be responsible for managing the customer concern. PPAP is the final document of supplier AQP process and concerns must be covered within supplier AQP.

2.8 The Plant/General Manager, Purchasing, Quality Manager & Supplier Quality are responsible for ensuring appropriate resources and support is provided for effective corrective action resolution, implementation, and verification.

2.9 It is the responsibility of Quality Managers, Purchasing Managers, Materials / Logistics Managers with support from Supplier Quality to ensure corrective actions are implemented in response to nonconformities found or Supplier Non-Conformance Reports (SNCR's) issued by a TI Automotive to one of our suppliers.

2.10 Regional Purchasing, Regional Supplier Quality, Regional Quality and Engineering is responsible for supporting the plants when appropriate, including interfacing with the supplier and if required, the customer on high risk issues.

3.0 DEFINITIONS:

3.1 Abbreviations

Abbreviation	Signification
AIAG	Automotive Industry Action Group
APQP	Advanced Product Quality Planning
CAR	Corrective Action Report by an audit finding (internal or external)

Abbreviation	Signification
COPQ	Cost of Poor Quality
DOE	Design of Experiment
FACT	Field Action Concern Team
FMEA	Failure Mode Effects Analysis
GQPS	Global Quality Performance System
ODT	On time delivery
PPAP	Production Part Approval Process
PPM	Parts Per Million
PPS	Practical Problem Solving
RPN	Risk Priority Number
SNCR	Supplier Non-Conformance Report
TIPDB	TI Purchasing Data Base

3.2 NCR Concerns / Quality Concerns

3.2.1. **Corrective Action** - action taken to detect and eliminate the cause of non-conformity or other undesirable situation to prevent escape and repeat issues.

3.2.2. **Formal Concern** - Any SNCR that is formally documented by a TI User Plant and where formal corrective action is requested.

3.2.3. **Critical Concern** - Some formal concerns are considered critical when an impact on risk related to product safety, liability/reliability, design, environment, customer designated high severity, customer sanction and/or field action/warranty.

3.2.4. **Informal Concern** - A potential concern voiced by a TI User plant that is not formally documented or not included in a SNCR. Informal or potential concerns are typically verbally communicated from TI Use plant, or documented during supplier visits by TI Automotive personnel. Informal concerns must be addressed as a way to drive preventive actions and continual improvements.

3.3 Delivery Concerns

3.3.1 **Standard Delivery Concern**- a standard delivery concern occurs when the supplier does not have the required quantity at the TI Automotive facility on the target date it is due. This can be under ship, over ship, late or early shipments.

3.3.2 **Ex-Works Delivery Concern**- an ex-works delivery concern occurs when a supplier does not have the required quantity on the dock ready for shipment at their facility on the target date it is due. This can be under ship, over ship, late/ early shipments.

3.3.3 **Consignment Delivery Concern**- a consignment delivery concern occurs when the supplier fails to maintain the inventory level within the target limits as agreed upon with the TI Automotive facility. This can be the inventory going below the minimum inventory target or above the maximum inventory target.

3.4 Warranty Concerns

3.4.1 **Supplier Warranty Concerns-** occur when there is evidence a field issue exists after zero kilometers that is determined via product and data analysis to be caused by a supplier to TI Automotive. These concerns can be either due to a Design problem when the supplier is responsible for the design or a manufacturing problem when it is due to a problem related to the supplier manufacturing process.

3.5 PPAP Concerns

3.5.1 **Late PPAP Submission-** The supplier has not provided all the required information for approval on the date it is due. This can be all of the PPAP information or sections of the PPAP information required by TI Automotive.

3.5.2 **Incorrect PPAP Information**- occurs when the supplier provides evidence or information in at least one of the PPAP sections that does not meet the requirements for TI Automotive. (Right first time) It can include data errors, missing information and information that show non-compliance where the supplier does not have written waiver from TI Automotive.

3.5.3 **Report Format** – The TI standard for documenting supplier corrective actions is the 8D Problem Solving Process. Similar formats that provide the same evidence and information can be utilized with approval from the TI user Plant Quality Manager.

4.0 REFERENCES / ASSOCIATED DOCUMENTS:

4.1	CP-8-ALL-40	Purchasing and Supplier Management Process
4.2	GP-8-ALL-1	Global Purchasing Policy
4.3	CP-8-ALL-41	Global Supplier Requirements Manual
4.4	GQPS Database	
4.5	TIPDB	

5.0 PROCEDURE DESCRIPTION:

5.1 **Corrective Action** - Each TI Automotive location will implement an effective corrective action process for resolving supplier concerns. This process shall at a minimum follow the steps outlined within the 8D process; briefly defined in 6.0 of this procedure, unless Customer mandated formats are required. The Manager that is responsible for the type of supplier concern being managed (See section 2.0) shall ensure that:

5.1.1 An appropriate champion is identified to lead the corrective action process, the associated team and act as the key contact with the supplier.

5.1.2 The Corrective Action Team is supported by the appropriate personnel required to ensure completion of the analysis and verify the effectiveness of supplier corrective actions.

5.1.3 The **EFFECTIVENESS** of the actions taken within the corrective action process is continually evaluated through regular review meetings. The effectiveness of containment steps, interim actions, root cause analysis, permanent corrective actions, systemic corrective actions and lessons learned/read across actions will form the basis of this review.

5.1.4 The SNCR is formally closed, with supplier verification and TI Automotive concurrence.

5.1.5 The Corrective Action documentation is properly archived and recorded. The recommended retention time for Corrective Action / Customer Concern documentation is 3 years minimum; unless otherwise specified.

5.2 Supplier Concern Handling

Any TI Automotive employee who initiates a supplier concern should complete the appropriate sections within the Global Quality Performance System (GQPS) and immediately distribute by e-mail notification, facsimile or telephone to the supplier and applicable TI Department Managers that may be affected by the concern. The Global Supplier Requirements Manual (GSRM) includes requirements for supplier response and TI Automotive staff must make sure the information is input into the database for accurate tracking. Response time may be used as an input to the supplier performance rating.

As written in the Global Supplier Requirements Manual, any supplier concerns initiated should follow this response timeline:

5.2.1 First 4 hours: Receipt of the concern verified by the supplier

5.2.2 **First 24 hours**: Complete the first three steps of the corrective action report which includes containment of product @ supply base, in transit inbound, in house, in transit outbound, in storage, @ customer) and send to the customer. Follow up with a phone call to verify from the supplier to ensure the TI Automotive User Plant has received all of the information and are satisfied.

5.2.3 **Within 14 days**: A root cause analysis and at least a plan for permanent corrective action from the supplier.

5.2.4 Supplier correspondence will be maintained to support the Problem Solving Document at each facility which contains the date and time that all updates are forwarded to the

TI Automotive User plant. It is recommended that verbal phone calls are made with each key supplier contact at the time updates are forwarded, and also recorded on the Problem Solving Document.

5.3 Critical Customer Concern Response

The Regional Quality Director and the Global Director of Quality shall be notified for all critical concerns relating to supplier product under any of the following circumstances:

5.3.1. The Customer is significantly upset regarding the concern or the Customer Plant Manager is personally involved with the issue.

5.3.2. Purchasing personnel at a customer will or have been involved.

5.3.3. A stop shipment (finished vehicles on hold) or recall will or could occur.

5.3.4. A serious inter-company and/or external rejection has occurred i.e. product performance failure – fuel leakage, repeat concern -containment breech with potential for the initiation of controlled shipping, launch issue, or, potential customer sanction.

5.3.5. A significant warranty spike is identified.

5.3.6. Failure of key performance testing at any TI Automotive location that could be an indicator of potential failure modes in the field.

5.3.7. Critical customer/supplier issues must be properly communicated to senior management within the supplier location and within TI Automotive. Suppliers are responsible for ensuring the fast, accurate and appropriate flow of information.

5.4 Rescinding Supplier Concerns

Upon investigation by the Plant Quality Manager or designee, or receipt of evidence from the supplier as proof the concern is not valid, the Plant Quality Manager or designee should contact the supplier and notify them the concern has been rescinded. Documentation of the "rescinded" concern should be recorded in the GQP database and a notice forwarded from the TI User plant to the supplier showing the concern deleted or rescinded. If the concern is not rescinded then it will be handled as a valid concern and all actions will be entered into the Supplier Concerns Section of the Global Quality Performance Database. All Appropriate internal and supplier personnel will be notified if a concern is rescinded and the concern database will be updated accordingly.

5.5 Lessons Learned

Suppliers and TI Automotive will apply the lessons learned and best practices to process and products that are similar to eliminate the cause of the non-conformity. The final steps within the Corrective Action Process, combined with verification the problem does not exist in any other products/processes are intended to:

5.5.1 Evaluate the effectiveness of the implemented corrective actions / countermeasures to eliminate repeat issues.

5.5.2 Analyze and prevent similar issues occurring on other platforms, and production lines for all supplier and TI Automotive locations.

5.5.3 Communicate and contain potential issues to all TI Automotive locations globally through Global Quality Alerts. Verify suppliers have notified any other plant in their company that could also have this concern.

5.5.4 Upgrade Technical Standards. (If applicable; and if the standard does not exist; create a new standard)

5.5.5 Verify APQP documents such as the PFMEA and Control Plan have been properly updated regarding the failure mode and RPN.

5.6 Mistake Proofing

TI Automotive utilizes mistake proofing methodology and expects suppliers to do the same.

5.7 Returned Product Test Analysis

TI Automotive expects suppliers to analyze all products returned by TI facilities. These analyses will be performed in a timely manner and results reported to TI; with records kept on file. The cycle time for analysis is dependent on the determination of root cause, corrective action and effectiveness.

5.8 Parts per Million (PPM)

TI Automotive will use information gathered during the corrective action process to calculate and report supplier quality performance; using Parts per Million (PPM) as one of the key performance indicators. Supplier PPM will be calculated as follows:

Supplier PPM= Quantity of parts rejected X 1,000,000

Quantity of parts received

Definitions:

5.8.1 **Parts Rejected:** Total number of parts confirmed to be non-conforming. When a concern is first issued; all product is considered "suspect" until evidence is provided by the supplier that clearly defines the actual number of parts that are not usable or require significant rework to use. The final PPM will reflect the actual defective product. The PPM numbers can be adjusted by the TI Plant quality team at any time when data/evidence supports such action.

5.8.2 The measure or unit used for calculating the PPM should be the same measure as used on the purchase order or material release; pieces, kg, feet, etc.

5.8.3 **Parts Shipped:** The total amount of parts shipped by the supplier during the reporting month.

5.8.4 PPM will be reported as a monthly value and also as a Year To Date value; which will be the key indicator used for reporting supplier performance.

5.9 Cost Recovery

All suppliers will be responsible for any costs associated with the concern they caused. TI will clearly document all costs associated with the concern and provide the details and the cost information to the supplier. Only actual costs and the costs for administration of these concerns will be included. The administration costs will be the fair cost for TI to manage the concern and will vary depending on region and labor costs for the TI user location.

5.10 **Changes**

Any changes to the product or process to correct an issue must be approved by TI before the change can be implemented. In addition, samples may need to be provided to the TI plant for verification of our process to ensure the changes do not adversely affect the ability to build assemblies. (Robot grippers, visions systems, pallets, etc.)

5.11 **Basic 8D Problem Solving Process**

5.11.1. **Choose a Team-** The 8D problem solving process is a "team oriented" activity that requires a cross-functional team comprised of staff with the right mix of skills, experience and authority to resolve the problem and implement permanent corrective action. A key concern with problem solving is not allowing the team members enough time to properly investigate a problem or to properly verify the solution works.

5.11.2. **Define the problem -** The more clearly a problem is described; the more clearly it is understood by everyone involved. This is a significant step in this process and any mistakes made during this activity can greatly affect the outcome of the problem solving effort. The information must be concise, accurate and should not include anything but facts. The problem definition must include quantity, when, where, impact to the customer and photos and diagrams as needed.

5.11.3. **Containment / Interim Corrective Action -** One of the first things that must be completed is containment of any/all suspect material to prevent further manufacture and / or shipment of defective material. Containment must include any lot of material that could potentially have this concern; anywhere in the supply chain; including in transit. During the 8D process and until authorized by TI; all product shipped to TI must be certified to ensure the issue does not exist in any new shipments.

5.11.3.1 Implement a temporary corrective action until such time as the root cause has been proven and the permanent corrective action has been implemented and verified effective. Interim corrective action must be monitored at all times to ensure the measure is effective. Interim

corrective action can include enhanced inspection such as 100% inspection; providing the inspection is capable of detecting any/all defects.

5.11.4. **Find the Root Cause and Eliminate it -** A formal process must be followed for root cause analysis. There are many tools and techniques that can be used such as Pareto Analysis, Ishikawa (fish bone), Is- Is/Not, 5 Why process and many other tools that help distinguish differences between parts that failed and parts that did not fail. It is very common to identify several potential causes and in some cases; multiple causes that may or may not be related. The most important part of this activity is to prove the root cause. The most effective way to do this is to replicate the problem. In all cases; if the root cause is not proven; then ALL potential causes must be addressed with formal, verified corrective action.

5.11.5. **Choose and Verify Corrective Action(s) -** Once the root cause(s) are identified and proven; permanent corrective measures must be identified and tested for effectiveness. Permanent corrective action must prevent the problem from repeating anytime in the future and also on any other programs / products supplied to TI Automotive. Verification must be thorough and evidence of effectiveness must be provided in the 8D.

5.11.6. **Implement Permanent Corrective Action(s) -** Once permanent corrective action has been tested and verified to be effective for preventing repeat issues; the action(s) must be formally implemented. All process and product related documents must be updated to reflect the improvement measures implemented; including PFMEA, Control Plan, Work Instructions, Visual aides, etc.. Training must be completed as required and documented. These actions must also be implemented on any other product/processes where the same concern could exist. NOTE: Any changes to the product or process must be approved by TI Automotive before implementation following the SRCA process described in the TI Automotive Global Supplier Requirements Manual. (GSRM)

5.11.7. **Prevention / Lessons Learned -** The problem must never occur again; on any product from any manufacturing location or process. All documentation such as the APQP documents mentioned above as well as design standards, manufacturing standards, DFMEA's and specifications must be updated to prevent the same type of issue. Mistake proof options should be considered for all future products that could potentially have this same failure mode.

5.11.8. **Celebrate Success / Congratulate the Team -** Corrective action / problem solving is hard work and when done correctly; takes a lot of resources and commitment from team members. A properly completed 8D, with effective permanent actions will prevent the same concern from reoccurring which in turn will save money and prevent further customer dissatisfaction. Preventing a problem from ever happening again is a very positive success and should be commended.

5.12 Controlled Shipping Process

Suppliers are expected to implement effective containment and corrective action measures whenever issues occur. Whenever those measures are not effective or in cases when the problem is very serious and requires special controls; Controlled Shipping may be required by TI Automotive. The level and scope of the controlled shipping will be defined by TI Automotive.

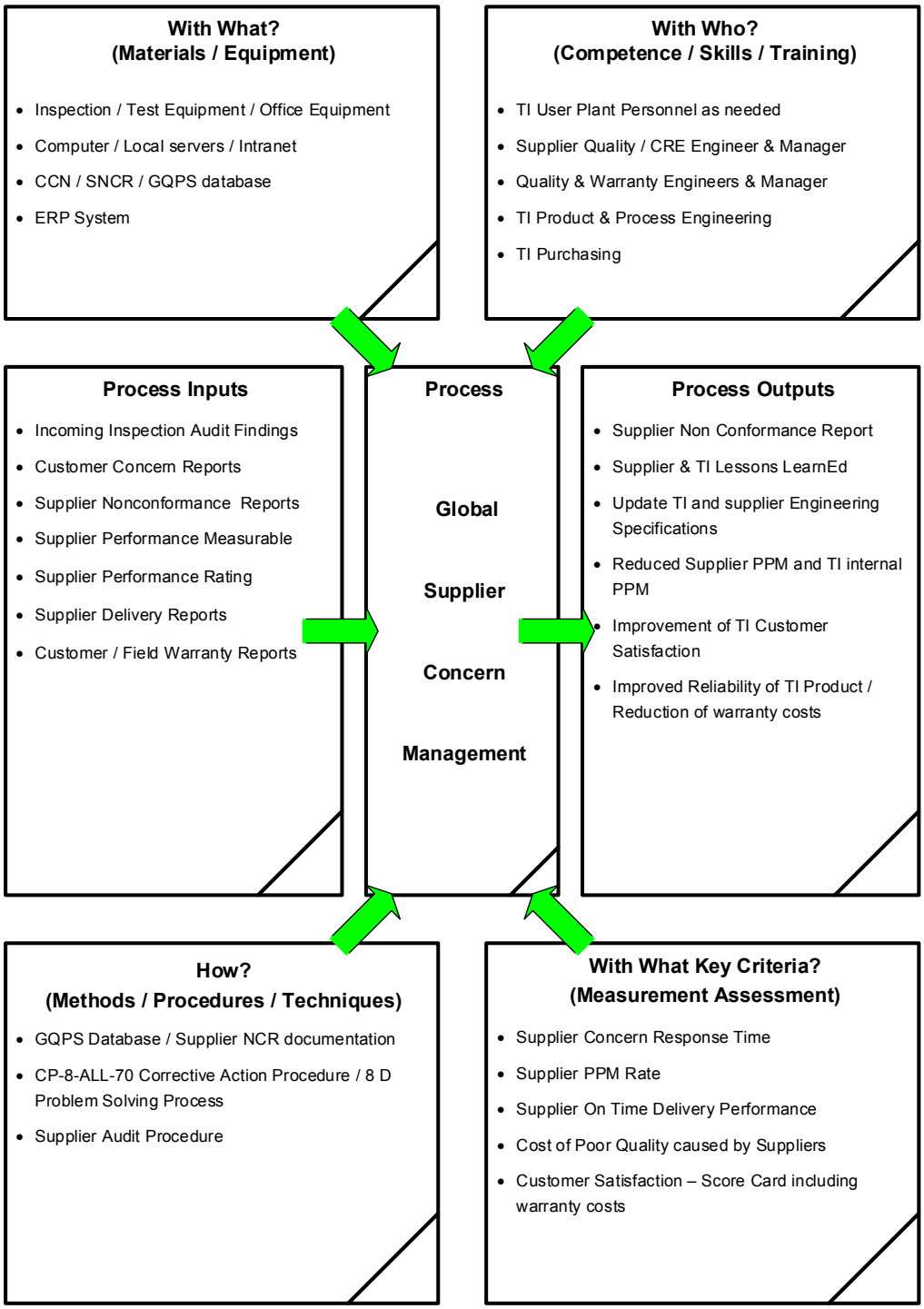
5.12.1 **Controlled Shipping Level 1 (CS1) -** CS1 is a formal containment process; managed by the supplier without third party involvement. The process requires enhanced controls to ensure the product shipped to TI does not have any of the issues defined in the scope of the request. The process requires detailed work instructions for the measures implemented and documentation of the effectiveness; often in daily reports where the issue warrants that level of communication. CS1 requires Management level involvement and verification at the supplier and is not just another level of inspection; but a very formal, audited and disciplined controlled process. It also requires special identification and labeling which will be agreed upon with the TI user plant.

5.12.2 **Controlled Shipping Level 2 (CS2) -** CS2 is basically the same process as CS1; except a third party containment company manages and performs the controlled shipping process. The third party audit company, approved by TI Automotive will be fully responsible for the development and implementation of the CS2 activities at the supplier location, at the TI user plant or wherever the containment activity is required.

5.12.2.1 Typically, CS2 will be implemented when CS1 activities have not been successful; but TI reserves the right to require CS2 when the risk or the impact of the concern is such it requires failsafe containment measures. In some cases, third party controlled shipping may also be implemented when the containment is not at the supplier manufacturing location and the containment activity requires immediate action. Formal written evidence of the effectiveness is also required for CS2 and will typically be provided to both TI and the supplier of the product under containment.

5.12.2.2 In those cases where the CS1 or CS2 activity is required due to issues caused by the supplier; the supplier is responsible for the costs of the containment activity.

5.13 Turtle Diagram of Supplier Concern Management Process:



6.0 REASON FOR CHANGE TABLE:

REVISION LETTER	REVISION DATE	DESCRIPTION OF CHANGE	APPROVAL HISTORY
A	16AUG2010	Release of new global procedure into the Corporate Quality System.	J. Phillion
B	20FEB2012	Changed procedure number to match new corporate scheme: From: GQPS-30-12 to CF-30-ALL-21	J. Phillion
C	15OCT2012	Added criteria for Quality, Delivery, Warranty and PPAP concerns	J. Phillion
D	31MAR2016	Review by Purchasing Core team: Modified the approvers	Global Corporate Purchasing Director*
E	7th March 2018	Modified to align with IATF 16949. Change document number from CP-30-ALL-21 to CP-8-ALL-46	Global Director Corporate Quality Systems
F	9th April 2019	Removed reference to CP-8-ALL-47 Supplier PPAP Procedure	Global Director Corporate Quality Systems