



Integrated Supplier Quality Requirements

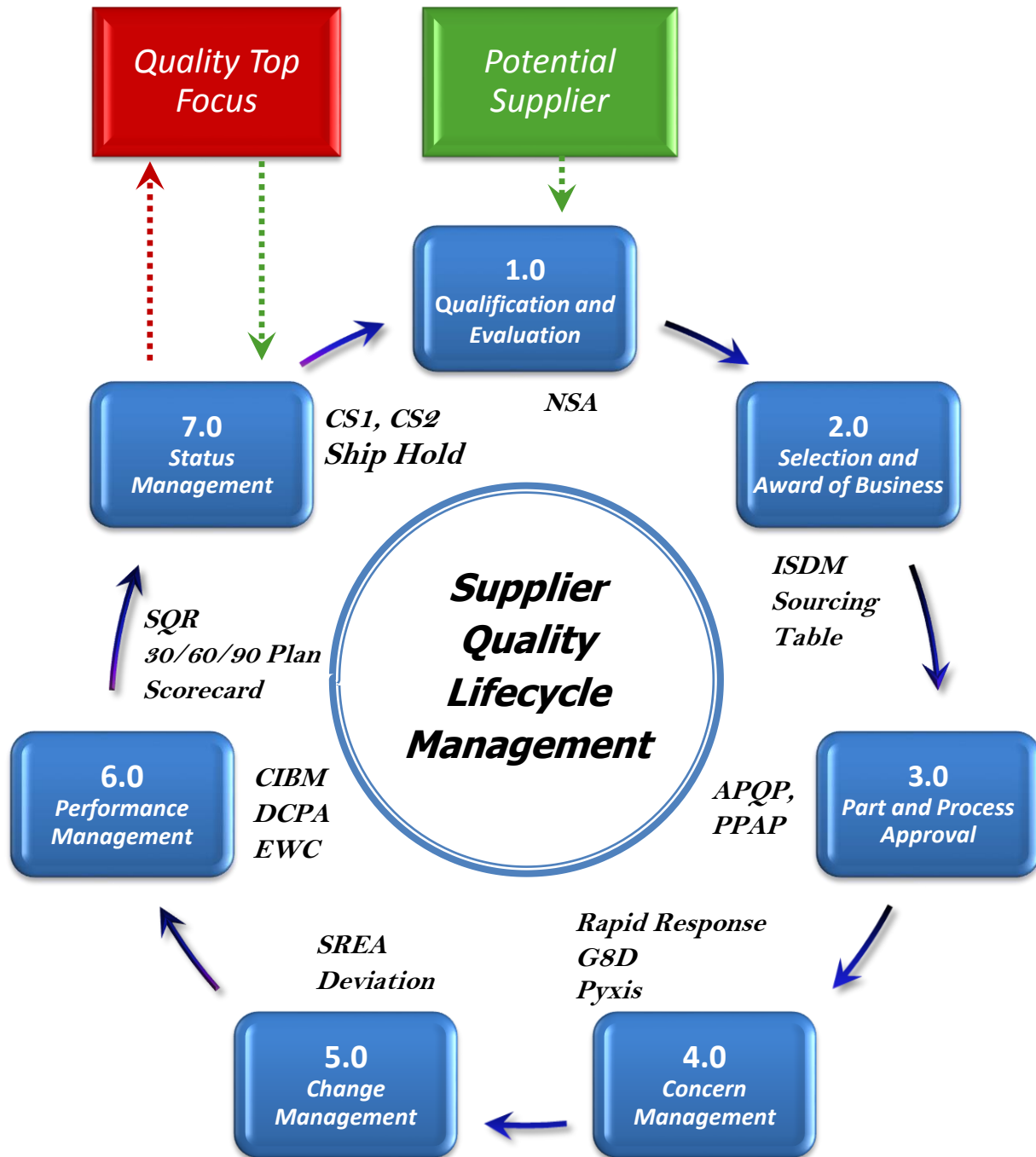
ISQ-001-QM

February 14, 2018

Revision F

The controlled and current version of this document, and all referenced documents, are available on www.navistarsupplier.com. Any printed or electronic copies are considered uncontrolled versions and may not be current.

Supplier Quality Lifecycle Management Diagram



The supplier quality lifecycle management diagram above illustrates the stages of interaction between Navistar and suppliers. It is a continual process that each supplier is expected to embrace, and use as guideline for doing business with Navistar. A learning module for each stage is available at www.navistarsuppliertraining.com. Supplier representatives responsible for quality and program management are expected to complete all training modules. Navistar evaluates suppliers' performance throughout the lifecycle, and uses those evaluations to drive continual improvement of part quality and service.

Foreword

Navistar has a long history of providing exceptional products to our customers. Those products could not be delivered without exceptional suppliers. The quality of Navistar's suppliers plays a crucial role in customer satisfaction and achievement of Navistar's goals. These goals could not be achieved without accountable and robust processes and procedures.

The Navistar Integrated Supplier Quality Requirements document defines the minimum quality assurance requirements for suppliers. It details the requirements that Navistar expects supplier management to drive at all levels, elevating the following Navistar Supplier Quality principles.

- 1) Embrace a partnership with suppliers to produce the highest quality products.
- 2) Challenge suppliers to improve processes and products.
- 3) Utilize value-added quality assurance activities "by the book" and remains focused on the fundamental processes.
- 4) Expect flawless product launches and zero defects impacting the company's manufacturing plants.

Navistar must ensure quality for all customers, which starts at the supplier's manufacturing location. Each member of the supply chain must take ownership of their process and understand their importance to Navistar and Navistar's customers. The supply base is expected to deliver on their commitments and ensure the highest level of customer satisfaction.



German A. Acosta
Director, Integrated Supplier Quality



Table of Contents

Foreword.....	3
Scope	6
Purpose.....	6
1.0 Supplier Qualification and Evaluation.....	7
1.1 Navistar Supplier Assessment – NSA (ISO 9001 7.4.1).....	7
1.2 Quality Management System Requirements (TS 16949 7.4.1.2).....	7
1.3 Special Processes (ISQ 9001 7.5.2).....	8
1.3.1 AIAG Special Processes.....	8
1.3.2 Navistar Defense Welding Requirements	8
1.4 Environmental, Health and Safety Certification (ISO 9001 6.4)	9
2.0 Selection and Award of Business.....	9
3.0 Part and Process Approval.....	9
3.1 Quality Planning (ISO 9001 7.1)	9
3.2 Phased PPAP (TS 16949 7.3.6.3)	11
3.2.1 PPAP Documentation	15
3.2.2 Test Capability (TS 16949 7.6.3)	15
3.2.3 Measurement Systems (ISO 9001 7.6)	15
3.2.4 Tiered-Supplier Flowdown.....	15
3.3 Navistar Drawings/Specifications (ISO 9001 7.3.2).....	16
3.3.1 Engineering Specifications.....	16
3.3.2 Design Validation Planning and Reporting - DVP&R	16
3.4 Special Tools for Design-Responsible Suppliers (TS 16949 7.3.3.1).....	16
3.4.1 Design Failure Mode and Effects Analysis – DFMEA	16
3.4.2 Installation Quality Assurance – IQA	16
3.5 Identification and Control of Restricted Substances (TS 16949 7.4.1.1).....	16
3.6 Process Failure Mode and Effects Analysis – PFMEA (TS 16949 7.3.3.2)	17
3.7 Control of Special Characteristics (TS 16949 7.3.2.3).....	17
3.8 Pass Through Characteristic – PTC.....	18
3.9 Manufacturing Under Controlled Conditions (ISO 9001 7.5.1).....	19
3.9.1 Control Plan (TS 16949 7.5.1.1)	19
3.9.2 Job Set-up Verification (TS 16949 7.5.1.3)	19

3.9.3 Identification and Traceability (ISO 9001 7.5.3)	19
3.10 Records (ISO 9001 4.2.4).....	19
3.11 Equipment Maintenance (TS 16949 7.5.1.4)	20
3.12 Appearance Approval (TS 16949 7.3.6.3).....	20
3.13 Prototype Parts (TS 16949 7.3.6.2)	20
3.14 Manufacturing / Assembly Tools and Fixtures Management.....	20
3.15 Tiered Supplier Quality Assurance Management	21
3.16 D-13 Packaging and Shipping	21
3.17 Part Identification and Labeling	21
3.18 Safe Launch Requirements	22
3.19 Directed Buy Components	22
3.20 Software Control	22
4.0 Concern Management	23
4.1 Rapid Response (ISO 9001 8.5.2)	23
4.2 Appropriate Corrective Action (ISO 9001 8.5.2).....	24
4.2.2 3 Legged 5 Why.....	25
4.3 Control of Reworked/Repaired Product (ISO 9001 8.3.2)	25
4.3.1 Use of Alternate Process	26
4.4 Return Material Authorization (RMA) Policy.....	26
5.0 Change Management.....	26
5.1 "Controlled Conditions" for Parts and Processes (ISO 9001 7.3.6).....	26
5.2 Permanent Part/Process Change Request (ISO 9001 7.3.7) (Tom).....	26
5.3 Temporary Part/Process Deviation (ISO 9001 7.3.7).....	27
6.0 Performance Management.....	28
6.1 Performance Evaluation and Communication (ISO 9001 8.2.1).....	28
6.1.1 Supplier Quality Review – SQR (ISO 9001 8.2.1).....	28
6.1.2 30/60/90 Day Action Plan (ISO 9001 8.2.1)	28
6.2 Supplier Scorecard (ISO 9001 8.2.1)	28
6.2.1 Delivery Performance (ISO 9001 8.2.1).....	28
6.2.2 Part Quality Performance (ISO 9001 8.2.1).....	29
6.4 Field Performance (TS 16949 8.2.1.1).....	29

6.5 Supplier On-going Performance Management	29
6.5.1 Internal Audit Program (ISO 9001 8.2.2).....	29
6.5.2 Management Review Expectations (ISO 9001 5.6.1)	30
6.5.3 Contingency Plan (ISO 9001 6.3.2).....	30
7.0 Status Management.....	30
7.1 Controlled Shipping (ISO 9001 8.2.1).....	30
7.1.1 Controlled Shipping Level 1 – CS1 (ISO 9001 8.2.1)	31
7.1.2 Controlled Shipping Level 2 – CS2 (ISO 9001 8.2.1)	31
7.1.3 Controlled Shipping Exit.....	31
7.2 Quality Top Focus – QTF (ISO 9001 8.2.1)	31
7.2.1 QTF Entry Criteria:	31
7.2.3 QTF Exit Criteria:	32
7.3 New Business Hold	32
Resources	35
Revision History	36
Appendix A – Navistar Defense Approved Alternate Quality Management Systems.....	39
Appendix B – Navistar Defense Welding Requirements	39

Scope

This document describes Navistar’s Quality Requirements for suppliers, who provide purchased parts to Navistar, Inc. It is part of the purchasing agreement for parts and materials used in the manufacture and assembly of Navistar vehicles, engines, and service parts. Contractual or other legal provisions shall take precedence over all requirements stated in this document.

Direct suppliers are required to cascade these requirements to lower tiered suppliers throughout the supply chain, a practice often referred to as “flowdown.”

Purpose

These requirements follow Navistar’s Quality Policy: “Navistar, Inc., is dedicated to consistently delivering reliable and durable products with superior value to our customer...throughout the lifecycle.” Navistar’s goal is to provide customers with the best products and services, and expects no less from its suppliers.

The seven sections which follow detail the requirements for suppliers, core tools to be used, and the way results are to be measured and evaluated. The Navistar Supplier Quality Representative will work with the supplier to ensure that any deviation from these requirements does not affect the finished part requirements.

When applicable, each heading includes a reference to the appropriate ISO 9001 or ISO/TS 16949 (clause.

1.0 Supplier Qualification and Evaluation

1.1 Navistar Supplier Assessment – NSA (*ISO 9001 7.4.1*)

The Navistar Supplier Assessment (NSA) is a formal examination of a supplier's production quality system and process conducted by a Navistar Supplier Quality Representative. Participation from all levels of the supplier's organization, including management, is expected during this evaluation. Navistar reserves the right to conduct an assessment at the supplier location at any time. For new suppliers, the assessment may be completed prior to, or after, the award of business, at Navistar's discretion. Navistar may choose to waive NSA for TS certified suppliers, with Integrated Supplier Quality concurrence.

A supplier assessment may be conducted at the manufacturing locations for prospective suppliers, current suppliers, and/or current suppliers with changes in manufacturing location, products, or engineering changes which affect the current product or process. The assessment may take several days depending on the complexity of the process under review.

Suppliers are expected to achieve an "A" classification and to take action for a classification less than "A". Formal corrective action using the Global 8D system is required for NSA line items receiving a six or less rating, and for an overall NSA score less than 80. These actions to mitigate the deficiencies noted in the assessment must be completed within an agreed upon timeframe. The Navistar auditor issues a "D0" Global 8D to capture the supplier corrective action responses, and to ensure it is visible throughout the Navistar organization. Reference the NSA Form for detailed explanation of the scoring and rating criteria.

1.2 Quality Management System Requirements (*TS 16949 7.4.1.2*)

Unless specifically exempted by Navistar, the supplier is required to be registered to, compliant with, or working towards, ISO 9001, or a quality management system such as ISO/TS 16949 (IATF 16949). AS 9100 quality system registration is an allowable alternative for suppliers supporting Navistar Defense programs (Refer to Appendix A). If Supplier is currently registered, then Supplier must maintain certification with an accredited registrar, and must furnish a copy of the registration certificate to Navistar. If Supplier is compliant to ISO 9001, but not certified by a recognized third party registrar, Supplier agrees to provide evidence of such compliance to Navistar. If Supplier is working towards its quality registration, then Supplier must provide, upon Navistar's request, evidence of such efforts and, upon receipt of its registration certification, inform Navistar and furnish copies of its registration

certificates. Suppliers are required to notify Navistar should suspension or loss of certification and/or major system findings in their QMS from any 3rd party Registrar. Navistar reserves the right to schedule and conduct a Navistar Supplier Assessment (NSA) at any time.

Regardless of quality systems registration status, suppliers must have an effective quality management system in place with adequate resources, to comply with all Navistar Integrated Supplier Quality Requirements as noted in the *Integrated Supplier Quality* and *Supplier Guidelines / Terms and Conditions* sections on www.navistarsupplier.com. Direct suppliers are required to cascade these requirements to lower tiered suppliers throughout the supply chain, a practice often referred to as “flowdown.”

1.3 Special Processes (*ISQ 9001 7.5.2*)

1.3.1 AIAG Special Processes

Suppliers with internal or outsourced “special processes,” as identified by the Automotive Industry Action Group (AIAG), are required to be conformant with relevant AIAG Special Process documents: CQI-9 Heat Treat Systems Assessment, CQI-11 Plating Systems Assessment, CQI-12 Coating Systems Assessment, CQI-15 Welding Systems Assessment, CQI-17 Soldering Systems Assessment, CQI-23, Molding System Assessment, CQI-27 Casting System Assessment, or other standards and/or guidelines specified on product drawings/specifications or other contractual provisions. In addition, all suppliers, who provide special process product, must comply with the following requirements:

- Tier 1 suppliers shall pass this Special Processes requirement down to Tier 2 suppliers, and the Tier 1 supplier shall have evidence of compliance by the Tier 2 supplier.
- Annual audits are mandatory for all tiered supplier heat treatment (CQI-9), and casting (CQI-27) operations. Tier 1 supplier, customer, or third party assessment may be acceptable, with Navistar Integrated Supplier Quality agreement. The annual audit results shall be made available to the Navistar Supplier Quality Representative upon completion, and upon request.

When requested, suppliers, and their tiered suppliers, are required to show evidence of compliance with these special process requirements, and take effective corrective action to address each “not satisfactory” and “needs immediate action” item.

1.3.2 Navistar Defense Welding Requirements

Navistar Defense suppliers, with welding processes, must comply with the provisions of Appendix B, unless specific Navistar Customer contractual provisions supersede these requirements.

1.4 Environmental, Health and Safety Certification (ISO 9001 6.4)

Navistar recommends suppliers be certified to the current ISO 14001 Environmental Management standard. Whether certified or not, suppliers are expected to adopt a responsible environmental management system which satisfies all applicable legal requirements.

Navistar expects suppliers to provide a healthy and safe work environment, and to encourage their employees to accept responsibility for working safely. Compliance with, or certification to, the current ANSI Z-10 or OHSAS 18001 Health and Safety Management standard is the recommended way to ensure health and safety remain a top priority.

2.0 Selection and Award of Business

Navistar selects and awards business to suppliers through a cross-functional process utilizing a Category Management Team (CMT). Depending on the extent of the decision, the CMT may request input from Navistar executive management. Criteria for selection and award include, but are not limited to, quality and warranty history, financial stability, competitiveness, and supply chain logistics.

NSA evaluations, CQI audit results when applicable, and quality management system certifications are inputs into supplier selection and award of business.

3.0 Part and Process Approval

3.1 Quality Planning (ISO 9001 7.1)

Navistar requires all Suppliers to take ownership of, and manage, the APQP process. During product and process development, suppliers are required to use a structured cross-functional approach. Use of the Navistar APQP workbook to document the planning activity is recommended. This workbook is located on www.navistarsupplier.com.

During quality planning activities, controlled conditions are identified, implemented, and documented for the manufacture of Navistar products. Suppliers must track progress and ensure on-time completion of critical items during the planning process.

Suppliers are required to use the APQP process to assure controlled conditions are developed and followed, for the duration of the part production cycle. Suppliers are required to conform to the techniques identified in the AIAG "core tools" (APQP, PPAP, MSA, SPC, FMEA), or equal standards such as VDA, to support planning and ongoing quality control efforts.

Suppliers must require APQP from their sub-contractors and have the records available for review by Navistar.

Pass Through Characteristics (PTC) are required to be identified during the APQP activities. See section 3.8 in this manual for additional information.

New product launch quality planning documentation and activities must include a Safe Launch process, to ensure product conformance. See section 3.18 for additional information.

Navistar new product development (NPD) launch cycle includes a series of vehicle builds. These builds are intended to evaluate Navistar assembly plant and supplier manufacturing capability, product quality, and readiness for Job 1 launch. Supplier readiness is evaluated through the Phased PPAP process. See section 3.2 (Phased PPAP) for additional information.

The table below aligns the Navistar NPD build events with the minimum Phased PPAP requirement.

KEY:

(P) = Navistar engine business

(V) = Navistar vehicle business

Cert Build = Provide production vehicles and engines for certification, final validation, marketing/show, reliability growth and field test. Validate manufacturing processes and exercise production material systems. Manufacturing build. Total manufacturing production-intent processes.

Q Build = Verify components and assembly processes meet product requirements and intended performance when run at reduced, controlled capacity volumes. Ensure complete manufacturing and supply base readiness to meet normal production expectations of quality.

VC Build = Verify components and assembly processes meet product requirements and intended performance when run at planned capacity volumes.

Job 1 Build = Implement a controlled production start, producing engines and vehicles for final customers.

Build Event	Minimum PPAP Required	Comments
(P) DV Build (V) DV Build	Phase 0	This requirement applies to new product DV builds at Navistar engine and vehicle assembly plants only. DV builds at other locations are not affected by this requirement. PPAP is required, if the part design is released, and the part is made by the intended production source. The Navistar Supplier Quality representative may elect to request PPAP for any DV build part, if a valid need arises.
(P) SV Build (V) Cert Build	Phase 0	Phase 0 parts are not usable on saleable engines or vehicles. Business decisions desiring part use requires approval through the OKT process. Minor programs and/or non-OKT review programs require approval by the Navistar ISQ Director level or above, or designee.
(P) PV Build (V) Q Build	Phase 1	Production level parts made from the production process with Phase 1 or greater PPAP approval.
(P) VC Build (V) VC Build	Phase 2	Production level parts made from the production process with Phase 2 or greater PPAP approval.
(P) Job 1 (V) Job 1	Phase 3	Production level parts made from the production process with Phase 3 PPAP approval.

3.2 Phased PPAP (TS 16949 7.3.6.3)

Supplier Production Part Approval Process (PPAP) documentation defines the methodology and results which demonstrate compliance to Navistar requirements. Navistar uses the Phased PPAP approach, and compliance to Navistar PPAP requirements is mandatory for suppliers, and tiered suppliers. The AIAG PPAP Manual is the foundation of Navistar's Phased PPAP process, but Navistar requirements take precedence over the AIAG publication, where differences occur. In addition, certain Customer specific requirements could apply. The Navistar Supplier Quality Representative will provide guidance as necessary.

The submission level and the PPAP phase is dependent on the impact to the Navistar plant, expected volume, supplier's manufacturing process, new part / new process, and risk of supplied part failure which would result in warranty costs. The Navistar Supplier Quality Representative will provide guidance.

The table below, defines each PPAP Phase.

Phase 0 - Prototype
Prototype level part or process, or parts produced on a less than complete production process. Phase 0 parts are not usable on saleable engines or vehicles. Business decisions desiring part usage requires approval through the OK To (OKTX) process. Minor programs and/or non-OKTX review programs require approval by the ISQ Director level or above, or designee.
Phase 1
Production level part and process. Parts are produced on one stream of a planned multiple stream process, or a low volume alternate production process, or when volume prohibits completion of statistical capability requirement. The remaining planned streams, or the intended production process, are not yet available and/or ready for PPAP. All elements of PPAP are completed, except run at rate.
Phase 2
Production level part and process. All streams of planned multiple stream processes, or the only planned production process, have been completed. All elements of PPAP are completed, except run at rate.
Phase 3
All streams of planned multiple stream processes, or the only stream of production, have been completed. All elements of PPAP are completed, including run at rate. Supplier to complete run at rate declaration section on PSW.

The table below indicates the reasons for PPAP submission and the required PPAP Phase.

PPAP REASON	PPAP PHASE	COMMENTS
Program Launch New Part New Supplier New Location; Current Supplier Additional Production Stream	Phase 0 through Phase 3	All Phases may not be needed, depending on the maturity of the part and process under review.
Global 8D Actions Design Change Sub-supplier Change SREA Approval	Phase 3	A change to a part or process that should already have Phase 3 approval

Suppliers are expected to do everything necessary to achieve full approval and meet Navistar PPAP requirements, prior to shipping the product to Navistar. Navistar recognizes situations exist where all elements of PPAP cannot be met, prior to part need, and additional work is necessary to achieve full approval. The Phase 1 Open exception based PPAP category exists to address such situations, and document which Phase 1 or greater elements are incomplete at time of submission. The Navistar Supplier Quality Representative will determine when this category may be applied.

Phase 1 Open

Parts must be manufactured on a production level tool and manufacturing process. Phase 1 Open status cannot be applied to a prototype part or process.

This Phase is an exception status used when all elements of the required Phase cannot be met. This status indicates additional work is necessary to achieve Phase 1 or greater PPAP status. Phase 1 open status has a limited duration and will expire.

Business decisions desiring part usage require approval through the OKTX process. Minor programs and/or non-OKTX review programs require approval by the ISQ Director level or above, or designee.

*Approval can only be granted for the current build event for new program launches, or 60 days for non-program launch PPAP activity.

As part of PPAP submittal, suppliers must provide a Navistar Phased PSW, signed by a person with responsibility and authority for quality, indicating acceptance and understanding of Navistar requirements.

The Navistar Supplier Quality Representative will review the PPAP submission to verify conformance to requirements are met. Suppliers are expected to resolve PPAP submission issues discovered during the review, in a timely manner. Suppliers are expected to plan for such possibilities, and ensure PPAP does not prevent missed MRD. Suppliers must implement a 100% inspection process for part features, or characteristics, which do not meet Navistar requirements, when PPAP status is less than Phase 1 PPAP approval.

After review and acceptance of the PPAP submission, the Navistar Supplier Quality Representative will sign the PSW indicating shipment of the part may begin.

Parts may be shipped to Navistar sites, plants, or facilities only after the supplier has received a copy of the signed Navistar Phased PSW. No other authorization (e.g. verbal release, email, or any other manner) constitutes authorization.

It is the supplier's obligation to refer any Navistar personnel requesting shipment before PSW approval to the assigned Navistar Supplier Quality Representative. It is the supplier's further

obligation to refuse to ship until an approved PSW has been provided. Incomplete items require immediate corrective action and must be followed-up promptly with full approval submission.

The table below, further aligns each element of the Navistar Phased PPAP process, with the corresponding minimum required documentation:

Requirement by PPAP Phase					
PPAP Elements (AIAG)		0 (Proto)	1	2	3
*Navistar Specific Requirements					
1	Design Record	Y	Y	Y	Y
1.1	Restricted Substances (IMDS as applicable)		Y	Y	Y
1.2	Polymeric Part Identification (as applicable)		Y	Y	Y
2	Engineering Change Documents, if applicable (deviation)	Y	N/A	N/A	N/A
3	Customer Engineering approval, if required		Y	Y	Y
4	Design FEMA, if design responsible		Y	Y	Y
5	Process Flow Diagrams		Y	Y	Y
6	Process FMEA		Y	Y	Y
7	Control Plan		Y	Y	Y
8	Measurement System Analysis Studies		Y	Y	Y
9	Dimensional Results	Y	Y	Y	Y
10	Material Confirmation (Mat Type / No Restricted.)	Y	Y	Y	Y
10.1	DVP&R - Material Test Results		Y	Y	Y
10.2	DVP&R - DV Performance Test Results		Y	Y	Y
10.3	DVP&R - PV Performance Test Results		Y	Y	Y
10.4	DVP&R - include R&Q Approved Supplier IQA		Y	Y	Y
11	Initial Process Studies		Y	Y	Y
12	Qualified Laboratory Documentation		Y	Y	Y
13	Appearance Approval Report (AAR)		Y	Y	Y
14	Sample Production Parts		Y	Y	Y
15	Master Sample		Y	Y	Y
16	Checking Aids		Y	Y	Y
17	Records of Compliance		Y	Y	Y
18	Part Submission Warrant (PSW)	Y	Y	Y	Y
*19	Pass Through Characteristics Analysis		Y	Y	Y
*20	Run at Rate				Y
*21	EDI Compliant		Y	Y	Y
*22	Packaging and Labeling				Y
*23	Software Control and Traceability		Y	Y	Y

3.2.1 PPAP Documentation

Suppliers are required to submit the Navistar Phased PSW for each PPAP phase.

Suppliers are encouraged to use the optional PPAP tracking form in the APQP workbook, to monitor progress, and align activity with expectations.

The default phase is Phase 3 and the default PPAP submission level is 4.

Suppliers shall maintain complete PPAP documentation, as specified in paragraph 3.2. All documents that are created as evidence of compliance to PPAP requirements must be submitted in English language, or the local language with English in parenthesis. PPAP records must be available for Navistar's review at any time. All required PPAP documentation must be maintained for parts in production at all times. Significant changes, as noted in the AIAG PPAP Manual, Table 3.1, must be reported to Navistar through the change management process prior to implementation, and submitted for PPAP approval, prior to shipping parts from the changed process. PPAP records must be maintained for the life of the production part plus one year, unless contractual agreements specify otherwise.

3.2.2 Test Capability (*TS 16949 7.6.3*)

Suppliers must have the capability, or outsource the resources necessary, to carry out the required layout, testing, material analysis, and certifications to generate needed records of conformance to requirements. This is inclusive of production intent, service, and prototype parts. Suppliers must retain complete test information with their PPAP documentation.

3.2.3 Measurement Systems (*ISO 9001 7.6*)

Measurement systems used for evaluation or qualification of Navistar product must be "calibrated or verified, or both, prior to use and at specified intervals, against measurement standards traceable to international or national measurement standards." (ISO 9001 7.6) Gauges listed on the control plan must be evaluated to determine measurement variability. This variability must be acceptable in accordance with the AIAG Measurement System Analysis (MSA) manual. These requirements extend to outsourced processes or external labs.

3.2.4 Tiered-Supplier Flowdown

Sub-supplier materials and parts must be capable of meeting specifications required by the contractual requirements and design records, and be verified during PPAP to include PPAP approval of sub Tier services, components and assemblies. Sub-supplier's processes shall be monitored periodically to verify conforming parts continue to be produced under controlled conditions. Suppliers are responsible to flow down all relevant contractual and/or design requirements to their tiered-suppliers. In the case of Navistar Defense suppliers, this includes relevant FAR/DFAR clauses and specific contract quality requirements, such as those related to welding or armor, which are required by Navistar's customer.

3.3 Navistar Drawings/Specifications (ISO 9001 7.3.2)

Suppliers must ensure that Navistar requirements are defined and understood prior to acceptance of business. When any aspect of the requirements is not understood or agreed, suppliers must provide a written request for explanation of the unclear points to the appropriate Navistar Engineer, the supporting Navistar Supplier Quality Representative, and Navistar Procurement Representative. If no questions are raised, Navistar assumes that suppliers understand the requirements, are capable of meeting the requirements, and will adhere to them.

3.3.1 Engineering Specifications

Suppliers are required to comply with applicable Navistar engineering specifications. IHS Global, www.global.ihs.com, is the approved source for obtaining copies of Navistar engineering specifications and suppliers are required to subscribe to this service as needed.

Outsourcing of processes does not absolve the supplier of its responsibility to conform to all requirements specified in the applicable Navistar engineering specifications.

3.3.2 Design Validation Planning and Reporting - DVP&R

Design-responsible suppliers must develop and implement a product test plan. Inputs for the test plan should include DFMEA, engineering specifications, and other Navistar or supplier engineering requirements. The proposed DVP&R plan must be reviewed and approved by Navistar engineering prior to the start of testing, and results must be reported to Navistar engineering when tests are complete. The completed DVP&R must be signed off by Navistar engineering. It is recommended that the supplier use the Navistar DVP&R template, but an equivalent template is acceptable. The Navistar Supplier Quality Representative and /or Engineer determine equivalency.

3.4 Special Tools for Design-Responsible Suppliers (TS 16949 7.3.3.1)

3.4.1 Design Failure Mode and Effects Analysis – DFMEA

Design-responsible suppliers must create and maintain the DFMEA as a living document throughout the product lifecycle. DFMEA inputs must include warranty issues, customer concerns, lessons learned, and address past Global 8D concerns. The DFMEA must be reviewed with Navistar to ensure completeness and currency. A single DFMEA may be acceptable for a family of parts when approved by the Navistar Supplier Quality Representative.

3.4.2 Installation Quality Assurance – IQA

Navistar may require suppliers to provide assistance, and/or documentation, to aid with handling, storage, assembly, installation, and service, of the purchased part. This partnership activity will identify improvement opportunities for both the supplier and Navistar, and reduce customer early life downtime due to assembly related issues. The Navistar Supplier Quality Representative will give guidance, as needed.

3.5 Identification and Control of Restricted Substances (TS 16949 7.4.1.1)

Suppliers must comply with Navistar Corporate Engineering Material Specification MPAPS B-50 concerning usage of certain chemical substances in Navistar products. These restrictions are based on outside regulations and/or requirements of Navistar. Named substances shall be

excluded from or restricted in parts, materials, equipment, manufacturing processes, or other goods, supplied to and/or manufactured by Navistar and intended for use in Navistar vehicles, engines, and other branded products. Suppliers will be required to maintain records showing conformance and must demonstrate conformance during the PPAP process.

For components supplied to Navistar for customers who require declaration of material substances, Navistar uses the International Material Data System (IMDS) as the system for suppliers to declare all the substances used in their parts. After Navistar has accepted the MDS, the MDS ID and acceptance date must be included on the Navistar Phased PSW. An accepted MDS is a requirement to receive full PPAP approval. Reference the Restricted Substances Reporting Procedure. The Navistar Supplier Quality Representative will provide assistance when these instances occur.

Suppliers shall maintain records showing on going conformance to GADSL (Global Automotive Declarable Substance List) for all components where IMDS is required.

Certain Navistar customers may have specific restricted material requirements (beyond MPAPS B-50), or use systems other than IMDS which will be applicable to suppliers. The Navistar Supplier Quality Representative will provide assistance when these instances occur.

3.6 Process Failure Mode and Effects Analysis – PFMEA (TS 16949 7.3.3.2)

A PFMEA is a living document which describes the risks to the production process and/or parts produced, and identifies actions taken to mitigate the risks, such as process controls. In preparation and maintenance of, refer to the AIAG FMEA manual for guidance.

PFMEA inputs must include warranty issues, customer concerns, lessons learned and address past Global 8D concerns. It should flow from the DFMEA, if available, for the part or part family. The PFMEA must be reviewed with Navistar to ensure completeness and currency. A single PFMEA may be acceptable for a family of parts when approved by the Navistar Supplier Quality Representative.

Control Plans (as discussed below) should reflect the results of both DFMEA and PFMEA development.

3.7 Control of Special Characteristics (TS 16949 7.3.2.3)

Special characteristics, such as KCC, CC, and SC, may be designated on Navistar drawings, engineering standards, design requirements documents (DRD), DFMEA, PFMEA, and/or other product documentation. These characteristics indicate government, safety, environmental regulations, or product function is affected. The requirements stated below must be met for designation, documentation, and additional control.

The appropriate symbol must be included on all related documents (including control plans, FMEAs, work instructions, process control documents) for the operations which produce special characteristics. Unless otherwise specified by Navistar, initial process study results for special characteristics must demonstrate stability and a minimum capability index (C_{pk}) of 1.67 to be

acceptable. Acceptable initial process study results must be demonstrated and submitted on request for each special characteristic and for any other characteristics requested, using the calculations defined in the AIAG Statistical Process Control manual. If an acceptable C_{pk} cannot be demonstrated, the assigned Navistar representative will be notified prior to PPAP submission and corrective action must be submitted for approval. Typical corrective actions include such alternative control methods such as mistake proofing (preferred) or 100% testing or inspection. See the AIAG PPAP and SPC Manuals for further guidance.

Suppliers must ensure their personnel understand the significance of special characteristics, and their necessary impact on manufacturing processes and support functions. Navistar expects that personnel working with operations affecting special characteristics understand what the special characteristic(s) in their operation means, the part function, and the impact of failure to Navistar or its customer.

If Navistar has not defined special characteristics for supplier part(s), it is the supplier's responsibility to identify any special characteristics needed as a result of the supplier's DFMEA and PFMEA activity.

3.8 Pass Through Characteristic – PTC

Pass Through Characteristics are part characteristics which are not controlled, or functionally tested anywhere downstream in the supply chain, are ultimately supplied to an OEM customer (e.g. it will "pass through"), and would have a significant impact on customer satisfaction and/or warranty. A PTC may or may not be a Special Characteristic.

Navistar's approach to pass through characteristics meets the minimum requirement defined in AIAG CQI-19 by using the definitions below. Characteristics must have a PFMEA Severity greater than 4 to be considered.

- Pass Through Characteristics (complete pass through) = PFMEA Detection of 10. A characteristic that will not be detected at any point prior to being delivered to Navistar's plant.
- Weak Detection (WD) (may pass through) = PFMEA Detection of 6-9. A characteristic that does not have robust detection, and might not be detected at any point prior to being delivered to Navistar's plant.
- Potential PTC – A characteristic which has no detection within the manufacturing supplier (PFMEA Detection of 10) and has not yet been reviewed to see if it passes through subsequent tiers of the supply chain.
- Potential WD – a characteristic which does not have robust detection within the manufacturing supplier (PFMEA Detection of 6-9) and has not yet been reviewed to see if it passes through subsequent tiers of the supply chain.

The Tier 1 supplier is responsible for identifying pass through characteristics, and working with their Navistar Supplier Quality Representative to put controls in place for those characteristics. The supplier and Navistar must reach an agreement on the proper method of control for the

identified PTC. Suppliers must complete and submit the PTC Form as part of the APQP and completion is verified as part of the Navistar PPAP approval process.

PTC symbol "P" must be noted on PFMEA and Control Plan, and the characteristic controlled with mistake proofing or other suitable means of protecting the Navistar plants and customers.

3.9 Manufacturing Under Controlled Conditions *(ISO 9001 7.5.1)*

3.9.1 Control Plan *(TS 16949 7.5.1.1)*

Control plans identify important part and process characteristics defined during APQP activity, and the control plan must reflect ongoing changes to PFMEA, such as those resulting from corrective action and process improvement. Changes require PPAP re-submission before product is shipped from the revised process. The control plan and PFMEA are living documents; always reflecting current controls and measurement systems in use. They must be updated as control methods and measurement systems are changed and improved, and be audited periodically as part of the supplier's internal audit process to assure continued effectiveness. Unless otherwise exempted by the Navistar Supplier Quality Representative, suppliers are expected to use the control plan format referenced in the AIAG APQP manual.

3.9.2 Job Set-up Verification *(TS 16949 7.5.1.3)*

Suppliers are required to have a process to verify that the manufacturing job is set-up properly. Inspection of the first good piece is a method to achieve verification, along with use of statistical methods, where applicable. In production lines with frequent part changes, a last-off inspection is also recommended for each run.

3.9.3 Identification and Traceability *(ISO 9001 7.5.3)*

Suppliers must identify Navistar product by suitable means through the manufacturing process and in all inventory locations. Suitable means may include cards, tags, signs, lot numbers, or bar codes.

The status of the product must be identified to mitigate the risk of suspect, nonconforming, or unapproved product being used or shipped to Navistar.

The depth of traceability required must be considered for each part and the amount of detail recorded must be related to the risk. Traceability considerations include permanency and legibility. For Navistar Defense suppliers, some specific examples would include transparent and high-hard armor, heat treat lot traceability, rubber part and other shelf life items; see your Navistar Supplier Quality representative for further guidance.

3.10 Records *(ISO 9001 4.2.4)*

The supplier must maintain routine quality data (e.g., quality indices updates, reliability test results, traceability, etc.) that are required by the design specifications, agreed to during APQP, or established as part of a corrective action plan. Such data shall be made available upon request.

The supplier must maintain capability data for all customer or supplier-designated “special characteristics”, and make capability information available upon request. In some cases, suppliers will be required to provide capability on a routine basis (e.g. monthly). The Navistar Supplier Quality Representative will provide guidance in such situations.

All product and process records must be dated, legible, and identify the person who created the record. Records are to be maintained for the life of the product plus one year. Specific contractual requirements will take precedence over these guidelines.

3.11 Equipment Maintenance (TS 16949 7.5.1.4)

The supplier’s production process shall be planned, maintained, and monitored to assure process capability is understood and controlled. Production equipment must be maintained in a way that minimizes unplanned downtime, process variation, and potential disruption of parts to Navistar manufacturing locations.

The supplier’s maintenance system must ensure that:

- Spare parts are readily available for critical manufacturing equipment,
- Predictive maintenance methods are utilized,
- Navistar owned tooling and equipment is identified, maintained, and preserved.

3.12 Appearance Approval (TS 16949 7.3.6.3)

Suppliers of interior, exterior, and certain under hood visual components must comply with the Visual Component Approval Process (VCAP) in order to achieve the appearance sign-off required for PPAP submission. A completed and signed Appearance Approval Report (AAR) must be submitted in the supplier’s PPAP package.

3.13 Prototype Parts (TS 16949 7.3.6.2)

Prototype parts must be inspected and validated to certify they meet the design intent.

For parts that are made using a production process and then modified or hand built, the requirement for verification before delivery is set forth in the Phase 0 PPAP requirements. Parts that are made using a production process and then modified or hand built, must be shipped under deviation and visibly identified.

Parts that are delivered as prototype parts must be inspected and validated to certify they meet the design intent.

Prototype parts must be visibly identified with container signage stating “prototype parts.” Individual parts must be identified in order to prevent mixing with production parts when removed from the container, where required.

3.14 Manufacturing / Assembly Tools and Fixtures Management

Suppliers must establish a system to track and manage Navistar issued tools, assembly tools, assembly fixtures, and gauges. Individual tool and fixture information shall be readily available and provided to Navistar upon request.

Following are the requirements of tools and fixtures management system

- Label and track each Navistar tool and fixture with unique identifiers
- Ergonomic storage and retrieval system
- Tool and fixture change, repair, calibration and audit schedules
- Record keeping of wear, repairs, calibrations and compliance to QMS
- Startup Shutdown audit records

3.15 Tiered Supplier Quality Assurance Management

Tier I suppliers are expected to manage sub-tiered suppliers to the same contractual requirements as they agreed with Navistar.

Tier I suppliers are expected to review and disposition sub-tier submitted APQP /PPAP documents, and ensure all Navistar requirements are met.

Tier 1 suppliers are expected to monitor the sub-tier supplier's performance on quality, delivery and other customer satisfaction metrics. If sub-tier suppliers fail to meet the Navistar requirements, the Tier I is expected to notify Navistar, and work with the offending sub-tier supplier to improve performance. In cases where remediation efforts have been completed, and attempts to improve the performance have failed, the Tier I supplier is expected to work with the Navistar Procurement team regarding Navistar intervention and/or exit plan.

3.16 D-13 Packaging and Shipping

Suppliers are required to follow D-13 Packing and Shipping Standard, and container specification form, located on www.navistarsupplier.com.

3.17 Part Identification and Labeling

Suppliers are required to identify components and packaging, per requirements specified in the D-13 standard, and/or part design records.

Suppliers are expected to take a proactive approach, to prevent and eliminate mislabeling error issues.

- Containment: Controlled Shipping CS1/CS2
- Labeling in PFMEA
- 5S, Plant Layout, Handling
- Internal Scan capability
- Identity verification in tooling, fixtures and dunnage
- Address labeling in Layered Process Audits
- Part Commonality – complexity reduction

3.18 Safe Launch Requirements

To support impeccable new product launches, suppliers must define and implement a safe launch process, sometimes referred to Enhanced Quality Initiative (EQI) plan. The EQI plan is not a substitute for the Production Control Plan but is over and above the Production Control Plan and is used to validate it. This process must remain in effect for 90 days after Job 1 minimum, and until all Pyxis concerns identified during the launch events have been corrected and verified. The following are the minimum EQI process requirements for start-up and launch. Navistar may add to this list, if circumstances warrant it.

- Pre-launch control plan post PPAP
- Formal Controlled Shipping Level 1 (independent of manufacturing process and personnel)
- Daily Layered Process Audits
- Weekly Management Dynamic Control Plan Audits
- Implement Pass Thru Characteristic Countermeasures
- Packaging Evaluation: Verify Labeling, Packaging and Quantity
- Pre-Launch Control exit criteria is zero CS1 findings

Failure to execute EQI may result in Controlled Shipping, reference section 7.1, Controlled Shipping. Shipment of discrepant material during the specified EQI period or any other time may result in Controlled Shipping.

3.19 Directed Buy Components

Business conditions arise where Navistar Purchasing may establish commercial relationships with tiered suppliers in the supply chain (directed buy components). In such cases, the Tier I supplier is responsible for the directed buy tiered suppliers, including APQP launch activity, PPAP dispositions, and quality issue identification and recovery efforts, from issue discovery to resolution (including, but not limited to, Global G8D). Navistar will intervene when proprietary or competitive issues are a concern. The applicable Navistar Supplier Quality representative will facilitate APQP and PPAP launch activities with the Tier I supplier.

3.20 Software Control

Supplier organizations, whose product includes software, embedded as a component in any supplied hardware (as a requirement for hardware functionality), shall implement and maintain a process for software quality assurance and traceability. Such suppliers are required to identify

and submit version / revision control, as part of the Navistar PPAP. The current version / revision will be recorded within the PPAP documentation, per PPAP element 23.

Suppliers are required to implement change management controls, for the implementation and communication of software version / revision changes. Supplier initiated changes, which affect fit form and function, require Navistar approval prior to implementation (reference section 5.0 Change Management), and re-PPAP.

This requirement shall apply to Tier I direct supplier and tiered supplier products (reference section 3.2.4 Tiered-Supplier Flowdown).

4.0 Concern Management

When problems arise, suppliers are expected to contain the problem and respond rapidly with permanent corrective action on Non-conforming material.

4.1 Rapid Response *(ISO 9001 8.5.2)*

Navistar will notify the supplier when non-conforming parts are discovered at Navistar, or a customer location. Immediate containment of suspect material is required for all parts as a response to any customer concern. Containment must address all suspect parts throughout the supply chain, including:

- Parts at the supplier locations, warehouses, or in transit between locations,
- Parts in transit to Navistar or their using locations,
- Parts on the production floor at Navistar using locations,
- Parts supplied as service parts.

A description of the containment method and the resulting certified product identification method must be provided to the Navistar Supplier Quality Representative.

Suppliers are responsible for coordinating the appropriate activities to identify and quarantine suspect material, record the containment results, and communicate to the appropriate parties when the activity is complete. A "clean point" with the first known conforming part must be communicated to the Navistar Supplier Quality Representative, and receiving plant quality personnel.

Navistar may initiate sorting of supplier parts when there is evidence of suspect material in the supply chain. Suppliers are responsible for all sorting activities prior to the point of application and will support Navistar with the sorting activities after point of application.

Suppliers are expected to perform all actions needed to return and replace suspect material and avoid, wherever possible, shutdown of Navistar manufacturing facilities. Navistar reserves the right to charge back the costs associated with supplier caused non-conforming product, including return of material.

If a supplier discovers that they have shipped, or may have shipped, nonconforming parts, the supplier must notify the Navistar manufacturing location and the Navistar Supplier Quality Representative immediately. The supplier must manage all aspects of the communication to prevent impact to Navistar.

4.2 Appropriate Corrective Action *(ISO 9001 8.5.2)*

Navistar Supplier Quality Representatives, plants, engineering locations, and parts distribution centers communicate non-conformances found directly to suppliers with requests for corrective action. Suppliers must address containment and corrective action requests in a timely manner and correct issues to the reporting location's satisfaction.

New program launch build issues are recorded in the Navistar Pyxis Concern system.

4.2.1 Global 8D

The Global 8D (G8D) reporting process is the standard for issue resolution at Navistar, but may have slight variation at the different Navistar operations. Suppliers must access the Prism Portal website at www.prismportal.net to address all G8D issues requiring action, including pre-production issues and issues where only a single defect is found. Corrective actions must include formal answer of the issue and use all of the G8D process steps. A new PPAP package with a Navistar Phased PSW may be required as a result of corrective actions taken.

Suppliers are expected to take ownership of the process, lead root-cause investigations, and report on a timely basis, as required by the assigned Navistar Representatives. Suppliers must maintain visibility of the G8D until it is closed and approved by Navistar. Suppliers are expected to obtain training in G8D methodology, if needed.

Suppliers are rated on timeliness of the corrective action responses. These metrics are indicated on the Enterprise Supplier Performance Scorecard.

Within 24 hours of notification, suppliers are expected to complete actions through step D3 of the G8D process. This step includes defining containment actions, coordinating with Navistar, and implementing containment. Other interim containment actions (ICAs) should also be implemented during this time.

Within 14 calendar days of notification, suppliers are expected to complete actions through step D5 of the G8D process. This step includes choosing and verifying permanent corrective actions (PCAs) for root cause and escape point.

Complete closure of the G8D is dependent on the severity of the problem and complexity of the permanent corrective actions required. Suppliers are expected to maintain open communication with the Navistar Supplier Quality Representative, to ensure all steps of the G8D process are completed accurately, timely, and appropriately.

4.2.2 3 Legged 5 Why

Navistar requires suppliers to use the 3 legged 5 Why (3L5W) problem solving tool in conjunction with each G8D. 3L5W is a technique used to create a detailed explanation of where, when, and how the problem occurred, by evaluating three separate areas, which could have contributed to the problem. The purpose of the 3L5W is to arrive at the root cause level, where the failure chain ends at the symptom, or effect, experienced by the customer, and results in three separate conclusions for improvement. Corrective actions shall address all three legs.

Problem solvers ask the question “Why?” five times successively, for each leg of the 3L5W analysis. The root cause will generally present itself by the 4th or 5th Why. Each “Why” must be supported by data, or fact. The known and collected facts from each “Why” lead to the next “Why”, as the process continues, concluding when the root cause is found. Actions are typically taken on the last “Why” for each Leg.

The three legs are:

- **Specific Problem** (Why was this non-conformance created?)
- **Detection** (Why did this non-conformance reach the customer?)
- **Systemic** (Why did the system allow the non-conformance to occur?)

Prevention of future problems are addressed in all three legs, with the following:

- Avoidance of the specific root cause through SPC (Statistical Process Control and Process Capability) or **Error / Mistake Proofing** (Poka Yoke)
- Establishment of **Standard Work Practices** to maintain consistency

The 3L5W template is located within the Global 8D portal. Contact the applicable Navistar Supplier Quality representative for additional guidance.

4.3 Control of Reworked/Repaired Product (ISO 9001 8.3.2)

No reworked/repared product may be shipped without Navistar authorization, except as allowed by the standard rework processes that are documented as part of the PPAP approval process. (Reference section 5.3 Temporary Part/Process Deviation).

Such product shall be subject to re-verification through the normal process controls, to demonstrate conformity to the requirements. Instructions for rework/repair, including re-verification requirements, must be accessible to and used by the appropriate rework and verification personnel. All re-verification results must be documented and made available to Navistar upon request. The supplier is required to maintain traceability of reworked/repared product, and communicate clean point information to Navistar.

4.3.1 Use of Alternate Process

Suppliers must assure PPAP approved processes are not changed, or bypassed, due to equipment malfunction, or any other reason. If such need arises, an effective alternate process must be established and qualified.

Use of alternate processes requires appropriate controls to protect against quality issues. Documentation of the event, and countermeasures for use of the alternate process, is required. Sign off by the quality manager and plant manager is required.

4.4 Return Material Authorization (RMA) Policy

All Navistar suppliers must comply with the following Navistar's Return Material Authorization (RMA) policy:

- Supplier's will have 5 calendar days to respond to a request for an RMA number.
- If the supplier does not respond within 5 days:
 - The material will be scrapped
 - The material cost will be charged-back to the supplier
- All information necessary to return domestic or global parts must be provided by the supplier.

5.0 Change Management

5.1 "Controlled Conditions" for Parts and Processes *(ISO 9001 7.3.6)*

Parts received by Navistar must always be produced by a production process approved by a Part Submission Warrant or Deviation. Suppliers must not ship, and will not be paid for shipments made without an approved PSW. Supplier PPAP documentation should always reflect the current process, and the process as approved by Navistar.

Suppliers and sub-suppliers, regardless of design responsibility, must notify Navistar of all intended changes. Navistar will respect proprietary products and processes. Suppliers must not change the approved production process without prior written authorization by Navistar. Navistar requires customer notification using a Supplier Request for Engineering Approval (SREA) and subsequent PPAP approval for all changes as identified in the AIAG PPAP manual.

5.2 Permanent Part/Process Change Request *(ISO 9001 7.3.7) (Tom)*

If a supplier wants to make a permanent change to a current production already PPAP approved part or process, a request must be submitted to, and approved by Navistar, before the change is made. The Navistar Supplier Request for Engineering Approval (SREA) form, located on www.navistarsupplier.com website must be completed and submitted to the applicable Navistar Supplier Quality Representative.

NOTE: SREAs are not to be used at time of quote, during new product launch phase, for cost reduction opportunities, or for emergency situations (such as termination of tier supplier relationships or to address changes already in process - i.e., a forced change). During these stages, the supplier is expected to work with the Navistar Supply Manager and Engineering, and if the change is accepted by Navistar, release, contract, and PPAP must be completed before the supplier implements the change. Deviation will be required for immediate need situations.

Navistar recognizes a change to a current stable and capable validated process may result in unanticipated variation in the new process, and loss of the initial validated baseline. To counter that, and mitigate negative impacts, suppliers who request process changes for critical parts listed in the Material, Parts, and Process Specifications (MPAPs), or defined on part drawings, are required to do the following:

- Conduct a level 5 Exit PPAP from the old process
- Provide a 3D CAD overlay comparison of a part produced on the old process with a part produced on the new process.
- Conduct level 5 PPAP on the new process

In addition, suppliers are required to implement and execute a run at rate and PPAP approval Safe Launch plan, for product/process transitions, including but not limited to, additional shifts added and/or use of same tools and/or techniques from a previously PPAP approved facility.

For changes affecting appearance related items, an Industrial Design Evaluation and Approval Log (IDEAL) Change Request Form is needed in addition to the SREA. Contact your Navistar Supplier Quality Representative for guidance on completing this requirement.

If an SREA is rejected, the supplier cannot move forward with the proposed change.

If a product change SREA is approved, the supplier must wait for the resulting engineering change release, and PPAP approval, before shipping the product. Suppliers are expected to follow the APQP and PPAP processes to implement the change.

If a process change SREA is approved, the supplier is expected to follow the APQP and PPAP processes to implement the change, and schedule a PPAP review with the Navistar Supplier Quality Representative. Suppliers must not ship product from a changed process prior to PPAP approval.

5.3 Temporary Part/Process Deviation *(ISO 9001 7.3.7)*

For temporary part and process deviations, contact your Navistar Supplier Quality Representative for guidance. The Navistar Supplier Quality Representative will determine which process is required depending on the requested deviation.

6.0 Performance Management

6.1 Performance Evaluation and Communication *(ISO 9001 8.2.1)*

Navistar provides frequent and ongoing feedback to each supplier in the form of an Enterprise Supplier Performance Scorecard. The Scorecard is intended to encourage excellence in terms of, Commercial Expectations, Quality, Delivery Compliance, and Service Parts/Aftermarket Sales.

Suppliers with exceptional performance are rewarded and recognized with the Navistar Diamond Supplier Award. Suppliers are selected for this award by cross-functional team input, and is based on a supplier performance in quality, warranty, technology, delivery, service, and cost.

6.1.1 Supplier Quality Review – SQR *(ISO 9001 8.2.1)*

Navistar communicates unsatisfactory performance in the Scorecard or other methods, and the supplier may be required to attend a Supplier Quality Review (SQR). During the SQR, the supplier's senior management and Navistar executive management discusses Navistar's expectations and the suppliers' performance. Immediate systemic corrective action and recommitment to Navistar's expectations is the desired outcome of the SQR.

6.1.2 30/60/90 Day Action Plan *(ISO 9001 8.2.1)*

An output to the SQR may include a 30/60/90 day action plan for improvements. The format details the implementation plan and the specified time frame. The Navistar Supplier Quality Representative will help develop the plan, monitor the progress towards completion, and evaluate the effectiveness of the actions taken.

Goals, targets, and timelines are mutually established with the Navistar Procurement Representative and Navistar Supplier Quality Representative, when a supplier cannot immediately meet Navistar's expectations. These goals and targets are continually measured and evaluated until the supplier eventually meets the expectations. If expectations cannot be reached in the mutually agreed upon timeframe, the Navistar Procurement Representative and Navistar Supplier Quality Representative will re-evaluate the commercial relationship and take appropriate action.

6.2 Supplier Scorecard *(ISO 9001 8.2.1)*

Navistar issues an Enterprise Supplier Performance Scorecard on a monthly basis. Suppliers are expected to access their scorecard which is available on www.navistarsupplier.com to view the results from the previous time period. A Scorecard Coordinator has been designated as the initial point of contact for all inquiries regarding the scorecard, including all reconciliations. Suppliers can contact the Scorecard Coordinator at EnterpriseScorecard@Navistar.com for training, a user-ID and password, or for general questions.

6.2.1 Delivery Performance *(ISO 9001 8.2.1)*

Navistar tracks and reports the delivery performance of all suppliers. Scorecard evaluation criteria include:

- Electronic Data Interchange (EDI) capable and/or compliant,

- Advanced Shipping Notice (ASN) accuracy,
- On-time delivery,
- Correct carrier,
- Correct documentation and adherence to NAFTA certifications,
- And, expedited freight cost.

Questions regarding delivery performance may be directed to enterprisescorecard@navistar.com or their respective material planners at the plants.

6.2.2 Part Quality Performance *(ISO 9001 8.2.1)*

Part quality problems are handled through the Corrective Action Global 8D process. Supplier's quality performance is measured in several ways including:

- Parts per Million (PPM) as received in the manufacturing plant,
- Containment timeliness (time to Global 8D step D3), and
- Resolution identification timeliness (time to Global 8D step D5).

Quality Performance Expectations

<i>PPM</i>	<i>Days to D3</i>	<i>Days to D5</i>
50	Within 1 Day ~ 24 Hours	Within 14 Calendar Days

6.4 Field Performance *(TS 16949 8.2.1.1)*

Part performance quality is monitored after delivery to the Navistar customers through warranty claims. Warranty data is analyzed and reviewed during continuous improvement meetings to drive continual design improvement. Suppliers may be engaged in containment, resolution, and prevention activities to the extent appropriate as determined by the Navistar Reliability & Quality, Supplier Quality, Engineering and/or Procurement functions. Urgency in resolution is expected at all times.

Any questions regarding field performance may be directed to the Navistar Supplier Quality Representative.

6.5 Supplier On-going Performance Management

6.5.1 Internal Audit Program *(ISO 9001 8.2.2)*

Suppliers must have an internal audit program to verify conformance to their quality management system, and ensure that it is effectively implemented and maintained. Navistar expects suppliers to perform system, manufacturing process, and product audits. These three types of audits shall be planned. The supplier must take internal corrective action without undue delay when non-conformances are detected.

To ensure compliance, suppliers are encouraged to incorporate the DCPA audit in their internal audit program (Reference section 3.9.1 Control Plan).

6.5.2 Management Review Expectations (ISO 9001 5.6.1)

Suppliers are expected to review Navistar provided performance metrics in their management review process. These performance metrics include quality, delivery, commercial, and parts which are included on Navistar's Enterprise Supplier Performance Scorecard.

The senior management team of the supplier organization is expected to review and respond to Navistar scorecards, corrective actions, and Navistar Supplier Assessments (NSA) actions. Senior management must assure any required action is taken in a timely and effective manner.

6.5.3 Contingency Plan (ISO 9001 6.3.2)

Suppliers must develop a documented contingency plan to mitigate the potential negative impact to Navistar manufacturing facilities. At minimum, the contingency plan must address part non-conformances, component or material shortages, equipment failure, utilities interruptions, and manpower issues, and include an extended shutdown / startup process utilizing the Navistar Shutdown Startup Process questions located on the supplier website at www.navistarsupplier.com (form ISQ-018-FO). Suppliers are required to ensure flow down of this extended shutdown / startup process throughout the tiered supply chain.

6.5.4 Dynamic Control Plan Audit – DCPA (TS 16949 8.2.2.2)

The Navistar Dynamic Control Plan Audit (DCPA) is a formal examination of production realization controls. The audit includes a review of documentation, manufacturing processes, final inspection, and shipping.

Navistar reserves the right to conduct a DCPA audit at the supplier location at any time. The activities, inputs, and outputs of the manufacturing process must be those approved during PPAP. To ensure compliance, suppliers are encouraged to incorporate the DCPA audit in their internal audit program.

Based on the scoring assessment, the supplier is expected to achieve an "A" classification. Suppliers are expected to take immediate action for a classification less than "A", or for DCPA line items receiving a six or less rating. Navistar expects that non-conformances are addressed immediately to reduce the risk of outflow of non-conforming product.

7.0 Status Management

7.1 Controlled Shipping (ISO 9001 8.2.1)

Suppliers are expected to remain in good standing at all times, and provide resources necessary to protect Navistar operations from non-conforming product impacts. When situations occur which adversely affect Navistar's business, Navistar reserves the right to initiate the controlled shipping process.

Controlled shipping can be initiated when a situation has occurred that meets one of the following criteria:

- Failure to resolve a defined non-conformity,
- Broken containment of a previously identified non-conformity,
- Suspected safety hazard to the Navistar using plant or carrier,
- Unauthorized change to a part or manufacturing process,
- Other non-conformity situations as deemed necessary by Navistar.

A formal notification letter is sent to the supplier when placed on controlled shipping. Suppliers remain at the controlled shipping status until:

- Permanent corrective action has been proven effective,
- All exit criteria detailed in the notification letter has been met,
- Formal exit letter has been received.

7.1.1 Controlled Shipping Level 1 – CS1 (ISO 9001 8.2.1)

CS1 requires the supplier to implement an offline part containment process, and report results to Navistar. The inspection personnel must be independent of the approved production process flow. The supplier is responsible for all costs associated with the CS1 activity.

7.1.2 Controlled Shipping Level 2 – CS2 (ISO 9001 8.2.1)

If the CS1 containment is determined to be ineffective, Navistar formally initiates CS2. CS2 requires third-party inspection, utilizing an offline containment process. The supplier is responsible for all costs associated with the CS2 activity.

If performance does not improve, supplier's future business with Navistar may be impacted.

7.1.3 Controlled Shipping Exit

Navistar removes the supplier from controlled shipping status when the supplier has met the controlled shipping exit criteria and continues to supply parts that meet Navistar's requirements.

7.2 Quality Top Focus – QTF (ISO 9001 8.2.1)

Suppliers unable to reach an acceptable performance level within the CS2 activity may be placed on Quality Top Focus. During this step, Navistar executive management engages with the supplier and the supplier is required to participate in a specified list of remediation activities to improve quality performance. The Navistar team works with the supplier to determine these activities and monitors progress closely.

The QTF process escalates the awareness of poor performing suppliers throughout Navistar. Supplier's performance must improve to an acceptable level to be removed from this status.

7.2.1 QTF Entry Criteria:

Suppliers may be nominated for QTF status, if any of the following criteria are met:

- 10 G8Ds accrued in a 12 month time frame.
- Impact to Point of Application (POA) due to high PPM, in plant sorting, offline rework and inventory, in-transit disruption, warranty failure, and/or uptime erosion
- Supplier caused quality impact and resulting in Ship Hold at Navistar plants.

- Supplier whose Controlled Shipping CS1 / CS2 actions are not effective to assure quality of parts
- Unauthorized changes

7.2.3 QTF Exit Criteria:

Suppliers can exit the Quality Top Focus status by implementing, documenting, and obtaining signoff from the Navistar Supplier Quality Manager on following exit criteria.

- Nomination of an executive champion
- Notify supplier ISO/TS registrar of Navistar Quality Top Focus status.
- Complete PTC workshop, and identify PTC / WD & countermeasures
- Implement Shutdown / Startup process
- Downward trend on PPM & 8Ds over minimum 3 months' time period
- 30/60/90 day action plan tracking (3 panel tracking of failure modes)
- Resolve systemic labeling issues if applicable
- Ship Hold Elimination if applicable
- NSA with no open deficiencies (no question score with 6 or less)

7.3 New Business Hold

Suppliers who have one or more of the following offenses may be placed on New Business Hold.

- Poor Progress to QTF exit plan
- Unauthorized changes
- Chronic quality issues / Ship Hold /Severe Commercial Issue

Glossary

3 legged 5 Why – A problem solving technique used to create a detailed explanation of where, when, and how a problem occurred, by evaluating three separate areas which could have contributed to the problem.

Advanced Product Quality Planning (APQP) – structured method of defining and establishing the steps necessary to ensure that a product satisfies the customer.

Calibration – a set of operations which compares values taken from a piece of inspection, measuring, and test equipment or a gage to a known standard under specified conditions. (PPAP)

Capability – the total range of inherent variation in a stable process. (PPAP)

Clean Point – exact point in the production stream with the first known conforming part after the manufacture of nonconforming parts.

Control Plan – written description of the system for controlling production parts or bulk materials and processes. They are written by organizations to address the important characteristics and engineering requirements of the part. (PPAP)

CQI Special Processes – Continuous Quality Improvement Standards published by The Automotive Industry Action Group (AIAG). The standards are listed in the appendix of ISO TS 16949 (IATF 16949).

Design Responsible Supplier – supplier with authority to establish a new, or change an existing, part specification. Note: this responsibility includes testing and verification of design performance within the customer's specified application.

Extraordinary Quality Initiative (EQI) – Strategy / Plan to implement a safe launch process, above and beyond normal control plan activities.

Failure Mode and Effects Analysis (FMEA) – a systematic group of activities intended to: a) recognize and evaluate the potential failure of a part/process and the effects of that failure, b) identify actions that could eliminate or reduce the chance of the potential failure occurring, and c) document the entire process.

Measure System Analysis (MSA) – determines the variation of the measurement system in proportion to the variation of the process and/or the allowable tolerance.

Navistar Product Development Build Events

DV - Design Verification Build

SV (Statistical Verification Build) – ensures plant fully understands how to assemble. Produce engines for validation and customer or vehicle builds.

Certification (Certification Build) – provides production vehicles and engines for certification, final validation, marketing/show, reliability growth and field test. Validate manufacturing processes and exercise production material systems. Total manufacturing production-intent processes.

Q (Quality Build) – verifies components and assembly processes meet product requirements and intended performance when run at reduced, controlled capacity volumes. Ensure complete manufacturing and supply base readiness to meet normal production expectations of quality.

PV (Production Validation Build) – verifies components and assembly processes meet product requirements and intended performance when run at reduced, controlled capacity volumes. Ensure complete manufacturing and supply base readiness to meet normal production expectations of quality.

VC (Volume Complexity Build) – verifies components and assembly processes meet product requirements and intended performance when run at planned capacity volumes.

Job 1 – implements a controlled production start, producing engines and vehicles for final customers.

Navistar Supplier Quality Representative – The Navistar Supplier Quality Representative works with the supplier to make sure quality requirements are understood and verifies the supplier has met PPAP requirements by signing the Part Submission Warrant (PSW).

Navistar Supplier Assessment (NSA) – a supplier assessment form focused on part and process development, sub-supplier management, manufacturing, and customer satisfaction. Form maybe located at www.navistarsupplier.com website.

Part Submission Warrant (PSW) – an document required for all newly tooled or revised parts in which (Navistar and its supplier) confirms that inspections and tests on production parts show conformance to customer requirements. (PPAP)

Pass-through Characteristic (PTC) – characteristics manufactured within the supplier process and used in (Navistar's or Navistar's customer's) process without modification or further validation.

Point of Application (POA) – point where the part is used in the manufacturing process.

Production – any part sourced for use at Navistar facilities intended for use on saleable engines or vehicles built at Navistar sites, plants or facilities and having completed documentation for approval per the Navistar Phased PPAP process.

Production Part Approval Process (PPAP) – a collection of documents providing evidence to Navistar that all requirements have been met. (PPAP)

Production Validation Testing (DVP&R) – test plan that validates the parts made from production tooling and processes meet customer engineering standards including functional, durability, reliability life, environmental and appearance.

Prototype Part – any part that is sourced by Navistar intended for the use on non-saleable vehicles and installed at Navistar sites, plants or facilities.

Quality Planning – a structured process for defining the methods (e.g., measurements, tests) that are used in the production of a specific part or family of products (e.g., parts, materials). Quality planning embodies the concepts of defect prevention and continual improvement as contrasted with defect detection. (APQP)

Special Characteristic – part and process characteristics designated by the customer or supplier, including governmental regulatory and safety, and/or selected by (Navistar) through knowledge of the part and process. (APQP)

Stable Processes – processes that are in statistical control. (PPAP)

Statistical Control – the condition of a process from which all special causes of variation have been eliminated and only common causes remain. (PPAP)

Stream – a term used for a production process that is referenced in the Phased PPAP table. One stream of a multiple stream process indicates that part will have more than one production process. (e.g. the process calls for 3 CNC lathes in parallel, meaning 3 streams.)

Supplier – any contracted individual, group or company having a contract with Navistar to supply parts, services, sub-assemblies or assemblies to Navistar plants, sites and facilities or to support Navistar’s dealers and customers for the purpose of building (engines or) vehicles.

Supplier Request for Engineering Approval (SREA) – Used when a Supplier requests a change to an already approved production part or process.

Resources

Enterprise Supplier Performance Scorecard (registration required)	www.navistarsupplier.com/scorecard/default.htm
Scorecard Coordinator	EnterpriseScorecard@navistar.com
Global 8D Process (registration required)	www.prismportal.net
Navistar specifications and standards (registration required with fee)	www.global.ihs.com
AIAG standards and manuals	www.aiag.org
Integrated Supplier Quality General Inquiries Regarding Requirements	ISQ@navistar.com
Navistar Supplier Training (registration required)	www.navistarsuppliertraining.com
Navistar Supplier Training (New Accounts Request / Support)	suppliertraining@navistar.com

The documents referenced are available on www.navistarsupplier.com at the Integrated Supplier Quality link. These documents are updated as needed and the supplier is responsible to ensure use of the current version at all times.

Cycle Step	Document Name	Document Number
1.0	NSA – Navistar Supplier Assessment	ISQ-004-FO
1.0	QMS/EMS Certification Submission Form	ISQ-012-FO
3.0	APQP Workbook	ISQ-005-FO
3.0	Phased PPAP PSW	ISQ-002-FO
3.0	Restricted Substance Reporting Procedure for Navistar Suppliers	ISQ-011-PR
3.0	Corporate Engineering Material Specification (MPAPS B-50)	MPAPS B-50
3.0	Visual Component Approval Process (VCAP)	EPS-158
3.0	Appearance Approval Report	EPS-158-FM003
3.0	Pass Through Characteristics Form	ISQ-009-FO
3.0	Run at Rate Form	ISQ-008-FO
3.0	Design Verification Plan and Report (DVP&R) Template	ISQ-011-FO

3.0	Supplier Quotation Feasibility Commitment	ISQ-014-FO
5.0	SREA – Supplier Request for Engineering Approval Form	ISQ-003-FO
5.0	Industrial Design Evaluation and Approval Log (IDEAL) Change Request	EPS-158-FM002
6.0	DCPA – Dynamic Control Plan Audit	ISQ-006-FO

Revision History

Revisions of this document are planned for November of each year. Subsequent revisions of this document may be released if needed. Supplier representatives that have completed one or more Navistar Supplier Learning Modules available at www.navistarsuppliertraining.com receive notification when a new revision is released.

Rev	Date	Revision Section	Revision Detail
A	11/1/12	New Document	NA - Initial Release
B	4/1/13	Front page and Footer	Update revision level to B and release date of 4/1/2013
		Lifecycle diagram	Replace CS3 with QTF
		Scope	Removed "North America (USA and Mexico)"
		3.2 Phased PPAP	Replaced Phased PPAP description with new tables and new definitions.
		3.2.3 Measurement Systems	Clarified that only measurement systems on the control plan need MSA studies
		3.3.2 DVP&R	Completed DVP&R requires Navistar engineering sign-off
		3.3.2 DVP&R	Added DVP&R Template to Navistarsupplier.com
		3.4.2 IQA	New paragraph about Installation Quality Assurance
		3.7 Control of special characteristics	Minor wording change for clarification.
		3.8 PTC	Made note that PTC form is now on Navistarsupplier.com
		3.13 Prototype	Paragraph brought in line with new Phased PPAP definition. Removed a sentence that contained duplicate information
		4.1 Rapid Response	Changed 3 deep containment "expected" to "required"
		5.2 Permanent Part/Process Change Requests	Clarified permanent vs. temporary part and process changes.
		5.3 Temporary Part/Process Deviations	Added paragraph for suppliers to contact Navistar Supplier Quality Representative.
		7.1.4 Controlled Shipping Level 3	Paragraph is now Quality Top Focus (QTF) and reworded.
		Glossary	Removed approval and changed to Authorization in the definition and added reference to APQP
		Resources	Put web site links in a table and added AIAG.org. Added Integrated Supplier Quality general inquiries email address. Added link to Navistar Supplier Training website Added Enterprise Scorecard general inquiries
B1	6/17/13	Supplier Quality Lifecycle Management Diagram	Changed "End of Business" block to "Quality Top Focus." Added green line returning from Quality Top Focus back to Status Management. Added reference in the Table of Contents so it is included in the Bookmarks.
		SRCA to SREA	Changed all references from SRCA to SREA.
		6.2.2 Part Quality Performance	Added Quality Performance Expectation table.
		Glossary	Added stream to glossary

			Added Navistar Product Development Build Events with brief description to glossary.
C	11/1/13	Title Page	Added verbiage that all referenced forms are available on www.navistarsupplier.com and indicated their location. All form references were removed from the body of this document.
		Supplier Quality Lifecycle Management Diagram	Added reference to www.navistarsuppliertraining.com and included verbiage that all supplier representatives responsible for quality are expected to complete all modules. Added "Diagram" after "Management"
		Forward	Added "Forward" section from Peter Melville
		Scope	Changed scope from Navistar plant to Navistar, Inc. Added that contractual or other legal provisions shall take precedence. Changed "trucks" to "vehicles" in 2 nd sentence.
		Purpose	Changed "clarify" to "detail" in 2 nd paragraph.
		1.2 Quality Management System Requirements	Added QMS/EMS Certification Submission Form Added the supplier must notify Navistar if they their QMS registration status changes.
		1.3.1 AIAG Special Processes	Added that suppliers are expected to take action from special process audit findings.
		1.3.2 Navistar Defense Welding Requirements	Added section Navistar Defense Welding Requirements
		3.1 Quality Planning	Added that some of Navistar's customers impose additional requirements on Navistar and that Navistar's suppliers must meet them.
		3.1 Quality Planning	PPAP Phase Table – Added "or designee" to approve use of Phase 0 parts in saleable vehicles. Added "Exceptions" to minimum PPAP Elements required for Phase 0 and Phase 1 Open.
		3.2.4 Sub-supplier Flowdown	Added reference to Navistar Defense supplier flow-down.
		3.3 Navistar Drawings/Specifications	Added "Suppliers must complete and return the Supplier Quotation Feasibility Commitment to confirm understanding of Navistar requirements."
		3.3.2 Design Validation Planning and Reporting – DVP&R	Changed "Suppliers" to "Design-responsible suppliers"
		3.4.1 Design Failure Mode and Effects Analysis - DFMEA	Changed "Suppliers" to "Design-responsible suppliers"
		3.5 Identification and Control of Restricted Substances	Changed "IMDS" to "International Material Data System (IMDS)"
		3.6 Process Failure Mode and Effects Analysis - PFMEA	Added reference to AIAG FMEA manual.
		3.7 Control of Special Characteristics	Clarified 2 nd paragraph regarding requirements for Special Characteristics.
		3.8 Pass Through Characteristics – PTC	Clarified definition of Pass Through Characteristics and Weak Detections. References AIAG CQI-19
		3.9.3 Identification and Traceability	Added requirement for Navistar Defense suppliers regarding traceability.
		3.10 Records	Changed paragraph to "All product and process records are to be maintained for the life of the product plus one year." Added the contractual agreements supersede this requirement.
		3.14 Phased PSW Approval Required	Added "(See paragraph 3.2 for guidance on Phased PPAP)"
		4.1 Rapid Response	Added paragraph regarding supplier's responsibility for sorting activities prior to point of application.
		4.2 Appropriate Corrective Action	Changed 10 business days to 14 calendar day for D5 expectation.

		6.2.2 Part Quality Performance	Changed 10 business days to 14 calendar day for D5 expectation.
		7.1 Controlled Shipping	Added line item 4 "unauthorized change to a part or manufacturing process," as a reason in initiate controlled shipping.
		7.2 Quality Top Focus - QTF	Changed 7.1.4 to 7.2 Changed QTF wording but not intent. Removed "QTF is the final step before recommendation to exit business with the supplier."
		Glossary	Add Point of Application definition
		Resources	Added link to suppliertraining@navistar.com . Added that suppliers are responsible to ensure that they have current revisions of forms. Added Industrial Design Evaluation and Approval Log (IDEAL) Change Request, QMS/EMS Certification Submission Form, and Supplier Quotation Feasibility Commitment
		Revision History	Added document revision timing and notification to suppliers.
		Appendix A	Added Appendix A – Navistar Defense Welding Requirements.
D	6/1/16	1.2 Quality Management System Requirements	Added clarification on ISO 9001 / TS 16949 certification compliance.
		1.3.2 Navistar Defense Welding Requirements	Removed word "area of special concern" statement as concern is self-evident by the requirement
		2.0 Selection and Award of Business	Added Navistar Diamond Supplier Award as plus for award of new business
		3.1 Quality Planning	Added Statement to use structured CF approach and AIAG Control plan manual Added APQP workbook location (www.navistarsupplier.com) Added word part production cycle instead of production program Removed term PPAP in paragraph
		3.5 Identification and Control of Restricted Substances	Changed spec from CEMS B-50 to MPAPS B-50
E	8/15/16	4.2 Appropriate Corrective Action	Added sections 4.2.1 Global 8D and 4.2.2 3 Legged 5 Why
		Glossary	Added 3L5W definition
F	2/14/18	SQ LifeCycle page 2	Revised inner circle content
		Table of Contents	Added sections 4.3.1 Use of Alternate Process and 3.20 Software Control
		3.2 Phased PPAP	Clarified parts may be shipped only after receipt of signed PSW.
		3.2 PPAP Element Table	Removed Phase 1 open column Aligned element 22, Packaging and Labeling, with Phase 3 Added element 23, Software Control
		3.20 Software Control	Added
		4.3.1 Use of Alternate Process	Added
		Defense Appendix B	Added AS9100 quality system registration

Appendix A – Navistar Defense Approved Alternate Quality Management Systems

- I. It is recognized that many small and/or unique supplier's in support of Navistar Defense programs utilize other methodologies to achieve product and process conformance rather than Navistar's standard practice of TS16949 and ISO certification.
- II. Although these are the preferred methodology of validating a subcontractor's product and process design requirement, Integrated Supplier Quality (ISQ) shall accept AS9100 quality system registration as a recognized higher quality certification.
- III. All suppliers in use of AS9100, shall maintain a current certification through an approved 3rd party registrar and shall communicate suspension, loss of certification and/or any major system non-conformance.

Appendix B – Navistar Defense Welding Requirements

- I. If the Navistar provided drawing does not have sufficient welding information then the supplier shall create a fabrication drawing(s) based on the Navistar provided model.
 - a. All welds shall be specified in accordance with AWS A2.4 - Standard symbols for welding, brazing and non-destructive examination.
 - b. Weld size, length and location shall be taken from the model.
 - c. Weld leg size shall be rounded up to the next US customary (inch) size.
- II. Any welding code violations or welding related errors on a Navistar provided drawing(s) shall be documented with an SREA [ISQ-003-FO].
- III. The following documents shall be submitted to and acknowledged by Navistar ISQ prior to welding production parts:
 - a. Welding Procedure Specifications (including prequalified materials and joints).
 - b. Procedure Qualification Records.
 - c. Welder Performance Records and/or Welding Operator Performance Qualification records with continuity records.
 - d. Weld Matrix or Map - On complex parts supplier shall provide a chart or annotated drawing indicating which WPS are used for each weld location.
 - e. CWI and CAWI credentials.
- IV. Welding procedures shall not be changed after the start of production without Navistar Defense approval.
- V. All welded parts shall be welded in accordance with:
 - a. Aluminum – AWS D1.2 current revision.
 - b. Steel (1/8" and thicker and 100ksi and less) – AWS D1.1 current revision.
 - c. Steel (less than 1/8" and 100ksi and less) – AWS D1.3 current revision.
 - d. Stainless Steel – AWS D1.6 current revision.
 - e. Steel (greater than 100ksi) – Ground Combat Vehicle Welding Code Steel – TACOM Drawing #12479550, unless waived by Navistar Defense.

- f. Aluminum armor - Ground Combat Vehicle Welding Code Aluminum – TACOM Drawing #12472301, unless waived by Navistar Defense.
- VI. All welding inspection shall be managed and approved by an American Welding Society AWS-QC1 or Canadian Welding Bureau Certified Welding Inspector CSA-W178.2. All Certified Welding Inspectors shall have access to the current revision on the applicable code(s).
 - a. Certified Weld Inspector shall ensure proper fit-ups.
 - b. Certified Weld Inspector shall ensure all welds are visually inspected.
 - c. Certified Weld Inspector shall ensure all welds are compliant to the applicable code(s).
 - d. Other inspection duties may be performed by an AWS Certified Associate Welding Inspector or CWB Level I Certified Welding Inspector who works under the daily and direct supervision of the Certified Welding Inspector.
- VII. All 100ksi and greater materials are subject to a (48) hour hold time unless waived by Navistar Defense. The final weld time and final inspection time shall be documented.
- VIII. A Certificate of Conformance shall be included in the PPAP submission. The CoC shall meet the following criteria.
 - a. Dated, signed and stamped by the Certified Welding Inspector.
 - b. Acknowledge all welding was in accordance with the applicable WPS.
 - c. Acknowledge all welding and inspections were in accordance with the applicable welding code(s).
 - d. Acknowledge the (48) hour hold time, if applicable, was observed.
- IX. Welded armor shall be traceable to date of final welding and heat number. Acceptable methods of identification are:
 - a. Serialization with supplier retaining records and material certs
 - b. Julian date with supplier retaining records and material certs
- X. Non-welded armor shall be traceable to the heat number. Acceptable methods or identification are:
 - a. Serialization with supplier retaining records and material certs
 - b. Julian date with supplier retaining records and material certs
 - c. Heat number with supplier retaining and material certs