25Q057
Rev. 1 (4/2011)

AWD STANDARD QUALITY PROGRAM REQUIREMENTS

For

SUPPLIERS of ITEMS WITH KEY CHARACTERISTICS

and / or SOFTWARE

for the SPIDER program
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<tr>
<td>Initial</td>
<td>6/24/10</td>
<td>For use on LRIP 3 SPIDER program</td>
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<td>A</td>
<td>9/01/10</td>
<td>Updated to add Sections 6.19 - Shipping and 6.20 – Packaging</td>
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<td>03/30/11</td>
<td>Incorporated Rev. B of the AWD Standard Quality Program Requirements for suppliers of items with key characteristics and / or software</td>
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ATTACHMENTS 1 AND 2
STANDARD QUALITY PROGRAM REQUIREMENTS

Standard quality program requirements for all products with key characteristics and/or software are defined in this section.

These standard requirements may be supplemented by an “ATK Inspection Procedure” document to incorporate changes necessary to maintain ATK compliance to external and internal customer requirements. This Addendum will be separately identified in the RFQ or PO. It will be provided to you by the ATK Buyer or instructions will be provided that enable you to retrieve it from an ATK website. Standard quality requirements in this document and any Addendum are in addition to the item-specific quality requirements contained in documents such as a Statement of Work, specification, drawing or Classification of Characteristics. If a conflict exists among these documents, contact the ATK Buyer for resolution.

Required submittals and approvals listed in any military and commercial specifications are to be made through and obtained from ATK rather than directly through a government agency.

Your liability and responsibility for 1) performance to the TDP, 2) safety programs, 3) reliability programs, and 4) performance to the purchase order/subcontract is in no way abrogated by ATK or Government review and/or approval of or concurrence with any plan, program or document.

6.1 SCOPE

Your Quality System must comply with the requirements of ISO9001:2008, an industry equivalent, or another quality system model that is appropriate for the product being supplied and is acceptable to ATK. Soldering and solder workmanship must meet the requirements of ANSI/J-STD-001C, Class 3 and IPC-610C, Class 3.

6.2 REQUIRED DOCUMENTATION

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<th>Document</th>
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<th>Reference</th>
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<td>Corrective Action Plan</td>
<td>As stated in ATK request for C/A</td>
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<td>First Article (FAAT) Plan</td>
<td>Notify ATK 45 days prior to required FAATs</td>
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<td>PPDs and PCD</td>
<td>Prior to production. Provide access to Government upon request.</td>
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<td>Changes to Controlled PPDs</td>
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<td>Process Control Detail Plans</td>
<td>Prior to production</td>
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6.2.2 Documentation Extension Requirements

Extensions of prior approvals of documents listed in 6.2.1 may be granted provided no changes have been made since the last ATK approval and the content meets the requirements of the new contract. Requests to extend approvals must be submitted to ATK in accordance with the time frames listed above.

6.3 AUDITS

6.3.1 Quality System Audits

ATK and the Government reserve the right to audit or examine the adequacy of your quality/inspection program and your sub-tier suppliers providing material for this program. The basis for any audit will be the quality/inspection plan and procedures, company quality manual, this document, supplier requirements related to product quality, and applicable military/commercial specifications and standards. If audited, your quality system (or your subs’) will be evaluated to the requirements of ISO9001:2008 or other quality system model appropriate for the product being supplied and which is acceptable to ATK.

In the event significant discrepancies are found, a discrepancy report will be issued. You are required to provide your corrective action plans to ATK and to implement appropriate corrective action.

In the event audit discrepancies are found and documented by a Government QAR in the form of a Corrective Action Request (CAR), you must forward a copy of the CAR to the ATK Buyer immediately upon receipt.

6.4 PCA AND FIRST ARTICLE REQUIREMENTS

6.4.1 Requirements for PCA

If you have not supplied the product to ATK in the past 90 days, ATK may require that you perform a physical configuration audit (PCA) on five samples of each component, subassembly, and assembly. Inspection of these samples will be performed for 100% of all drawing dimensions, characteristics, notes and associated TDP requirements, including drawings, specifications and Quality
Assurance Provisions (QAPs). Actual variable data must be recorded. You must notify ATK 30 days prior to the planned PCA date. ATK may witness PCA. You must submit all PCA data to ATK and describe any required corrective actions within 7 days of completion. ATK must approve the PCA results prior to production.

6.4.2 Requirements for FAAT at the Start of Production

Regardless of prior delivery history, ATK may require that you perform a first article acceptance test (FAAT) on a sample of all components, subassemblies, and assemblies using the approved Acceptance Inspection Equipment (AIE) and Acceptance Test Equipment (ATE). If a FAAT is required at the beginning of production on this order, it will be reflected in the “ATK Inspection Procedure” document attached to the purchase order. The sample size and characteristics to be inspected and/or tested will be in accordance with applicable Quality Assurance Provisions (QAPs) or will be as identified by ATK. At the discretion of the Government, however, these samples may be inspected / tested for 100% of all drawing dimensions, characteristics, notes and associated TDP requirements, including drawings, specifications and Quality Assurance Provisions (QAPs). Actual variable data must be recorded to the extent practical. You must notify ATK 45 days prior to the planned FAAT date. ATK may witness FAAT. You must submit all FAAT data to ATK and describe any required corrective actions within 14 days of completion. ATK must approve the FAAT results prior to production.

6.4.3 Other Conditions Necessitating First Articles

Whenever a significant lapse in production occurs (90 days unless ATK approves extension) or whenever a change in homogeneity occurs (ref. Para. 6.10.1), a FAAT will be required. In the case of changes not agreed to by ATK, the supplier shall be responsible for the costs associated with the additional FAAT.

6.4.4 Requirements for Performing FAATs When Responsibility Delegated by ATK

The FAAT provisions stated in paragraph 6.4 apply to FAATs conduct by ATK, as well as, those conducted by you. The FAAT requirement applies to your suppliers, and you must flow the requirements of paragraph 6.4 to your subs. ATK notification & approval is still required for your subs piece parts.

6.4.5 Additional FAATs Required Because of Disapproval

If the first article is disapproved, the supplier, upon ATK notification, shall submit an additional first article for inspection and/or test. After each request, the supplier shall select another first article for inspection. All costs related to these inspections are to be borne by the supplier, including any and all costs for additional inspections following disapproval. The supplier shall furnish any additional first article to ATK under the terms and conditions and within the time specified by ATK. ATK reserves the right to require an equitable adjustment of the contract price for any extension of the delivery schedule or for any additional costs to ATK related to these tests.

6.5 PRODUCTION PROCESS DOCUMENTATION (PPD) and PROCESS CONTROL DOCUMENT (PCD)

6.5.1 Requirements
You must generate and use written work instructions, Production Process Documents (PPD), for all processes affecting product quality. Work instructions should consist largely of pictures or graphics and must be posted at the workstation. The PPDs must include all the applicable items listed below that are deemed significant to the type of operation under consideration:

- Operation number
- Operation description
- Part number and revision
- Process drawing (when applicable)
- Detailed work instructions
- Classification level (1, 2, or 3).

Processes and associated PPDs will be classified per paragraph 6.5.2. Changes to PPDs will be managed per paragraph 6.5.3.

Access to work instructions at supplier facilities must be provided. Upon written request, copies of PPD's will be furnished to ATK or the Government.

A history file must be maintained for all PPDs including a description of changes and a record of when they were implemented.

### 6.5.2 Classification Level of Processes and PPDs

There are three classification levels for processes and PPDs. The preferred method of determining the classification level for an operation is a joint meeting between ATK and the supplier. If the classification level is not determined in a joint meeting, the supplier is responsible for assigning appropriate classification levels for all operations using the guidelines provided below and submitting them to ATK for review and concurrence. The determination of classification levels is based on the following guidelines, including the judgment of the responsible ATK representatives. **The classification of a process is based on its importance, not where it is performed. If a classification is not defined, then it automatically becomes a Class 1 Process.**

**Class 1 Process** - is one where safety and/or major performance parameters may be affected by a change to the process and the product features are not easily verifiable.

A change to a Class 1 process may require a FAAT. Changes must be submitted to ATK (reference 6.5.3). A detailed description of the change and when it has been implemented shall be recorded in a PPD history file maintained by the supplier.

**Class 2 Process** - is one where any of the following items may be affected: storage life, performance, producibility and/or assembly. Processes that are operator dependent, or have low repeatability may be considered Class 2 processes. The addition/deletion/interchange of a Class 3 process or operation is considered a Class 2 change. Other examples are changes in manufacturing location, methods, plan and/or procedures. A change to a Class 2 process may require a FAAT. Changes must be submitted to ATK (reference 6.5.3). A detailed description of the change and when it is implemented shall be included in a PPD history file maintained by the supplier.

**Class 3 Process** - is one where the process is repeatable and/or the product features are easily verifiable. There are several types of changes to Class 3
processes that may result in the change being considered a Class 2 change. For this reason, you must notify ATK prior to implementing changes (except administrative changes) to Class 3 PPD’s (reference 6.5.3). A detailed description of each Class 3 PPD change shall be included in a PPD history file maintained by the supplier.

PPDs must be available for ATK and Government review and concurrence with the classification. The classification of the PPDs must be completed prior to the beginning of production. If ATK has previously established classifications for PPDs of components manufactured under a prior contract, those classifications shall remain in effect for any subsequent award unless a PPD review is conducted.

6.5.3 Change Control

PPDs may be reviewed and/or reclassified periodically during a contract. You do not have the authority to unilaterally re-classify operations under any circumstances. ATK must approve all initial classifications and subsequent classifications.

The classification of a process and the associated PPDs determines the approval level necessary prior to revising a PPD. The approval requirements for Class 1 and Class 2 PPDs apply even if the process and documentation reside at your supplier. You should flow down the appropriate process documentation change control provisions in your purchase orders. The classes and associated approval levels are provided below:

- **Class 1**: Supplier may not change without prior formal submission and written approval by ATK.
- **Class 2**: Supplier may not change without prior formal submission to ATK.
- **Class 3**: Supplier may change without approval, but must formally notify ATK within fifteen (15) days prior to implementation.

6.5.4 Process Control Document (PCD)

A PCD must be submitted to ATK prior to production (ref. 6.2.1). A PCD consists of a process flowchart identifying the operation in the process where each PPD is applicable. The PCD must list each PPD by title, revision level and classification (1, 2 or 3). Whenever a PPD contains specific steps that are classified as 1 or 2, but the balance of the PPD is classified 3, those steps must be identified on the PCD.

The PCD flowchart must also identify each point in the process where SPC will be used to control the process (ref. paragraph 6.7).

6.6 SOFTWARE QUALITY ASSURANCE

If product software or acceptance test software is developed or existing software is modified as part of the product design activity, you must prepare a software development plan and software quality assurance (SQA) plan. The SQA plan shall be submitted to ATK for approval. The software will need to be validated and approved by ATK. Any changes to the approved software will require a new
validation including regression testing. Software changes may require a new FAAT at the discretion of ATK.

6.7 PROCESS CONTROL

6.7.1 General

ATK requires that processes and characteristics important to safety and performance be produced under conditions regulated by process control methods. Process control refers to methods employed such as SPC, closed loop feedback control systems, and operator in-process inspection to measure a manufacturing process and to make adjustments to remain in a stable and capable state. All such characteristics are to be considered for SPC control either directly or indirectly using variables data to the maximum extent possible.

Key characteristics are product or process characteristics that significantly affect end-item performance or safety. Characteristics that significantly affect cost or yield after ATK takes delivery of the product may also be considered key characteristics. ATK and the supplier will jointly determine whether there are any key product or process characteristics inherent in the product or service provided. If there are key characteristics, ATK and the supplier will identify those that are to be controlled by SPC.

6.7.2 Scope of SPC and Process Control

Whenever SPC or similar methodology for process control is required by ATK on key characteristics or other important characteristics to establish trend analysis and for in-family management, the following requirements apply.

6.7.3 SPC and Process Control Requirements

1. An approved Process Control Detail Plan addressing each key characteristic and its process control method is required prior to production (see 6.2.1 and Attachment 1). For characteristics controlled by SPC that are not key characteristics, a SPC Detail Plan is required prior to production (ref. 6.7.4). The plans must establish a process capability ($C_{pk}$) goal that is 2.0 or greater for key characteristics and 1.33 or greater for characteristics that are not key. For characteristics with attribute (go/no-go) data, the defect rate equivalent to a $C_{pk}$ of 2.0 is zero for a $C_{pk}$ of 1.33 it is .003%.

2. A monthly Process Control Report is required (ref. 6.7.5).

3. Control chart techniques shall be in accordance with the American National Standards Institute (ANSI) Z1.1, Z1.2 and Z1.3 or an ATK approved alternate.

6.7.4 SPC Detail Plan

Elements of the SPC Detail Plan should include the following:

1. Criteria for selection of characteristics and key components
2. List(s) of controlling characteristics
3. Implementation schedule
4. Requirements for lower tier suppliers of key components (key components are to be jointly defined by the supplier and ATK)
The plan will identify the characteristics that are key characteristics. Key characteristics may not be changed without ATK concurrence. You are encouraged to use SPC on other characteristics as well. These additional characteristics chosen for the application of SPC may be changed without ATK concurrence.

6.7.5 Process Control Reports

When in production, a *monthly* report is required that shows the status of each key characteristic. This report will be prepared in MS Excel and uploaded to a secure web site. ATK will provide templates for recording and reporting the data. Details of the process control data reporting preparation and reporting process are contained in Attachment 2. You may propose an alternate format for the *monthly* process control report if it contains equivalent or greater data. If the actual process capability or equivalent defect rate is less than 2.0 for a key characteristic or less than 1.33 for a characteristic that is not key, a cause must be identified and an improvement plan provided to ATK in the report. If a different report frequency is required, such as weekly, it will be reflected in the “ATK Inspection Procedure” document attached to the purchase order.

6.7.6 Flow Down

You must require your suppliers of product with key characteristics to use effective process control methods. As a minimum, SPC will be considered for controlling all key characteristics in a manner similar to that described above. You are responsible for including these key characteristics in your process control report unless directed otherwise by ATK.

6.7.7 Supplier Audits

ATK will audit and verify the supplier's approved SPC program on a continuing basis. As a minimum, the audit will determine:

1. Conformance to the approved plan
2. Presence of records that document whether or not the process was in control and appropriate actions were taken.
3. Evidence that the data was reviewed by the supplier for conformance to the requirements.

6.8 **ADDITIONAL AND EMPHASIZED REQUIREMENTS FOR PROCESSES WITH KEY CHARACTERISTICS**

As part of ATK’s continuous improvement initiatives, ATK is committed to partnering with our suppliers having key characteristics to accomplish the objectives listed below. Toward this end, you are required to host one, and if needed, additional on-site meetings to jointly prepare the listed documentation and perform the listed activities. The objectives for each key characteristic are:

- Failure Modes and Effects Analysis (FMEA).
- Mistake proofing assessment, to include the material handling processes, and an action plan with measurable progress toward accomplishing plan.
- Establishment of target value around which the process is centered.
- Action thresholds tied to defect rates or quantities.
- Action Log to document planned activities.
6.9 **SPECIAL PROCESSES, SPECIAL TESTS AND METAL FINISHING**

If accomplished outside your facility, special processes, special tests and metal finishing must be performed by a supplier acceptable to ATK. ATK reserves the right to disapprove the basis for vendor selection. If requested, ATK will assist you in locating a qualified supplier.

6.10 **SYSTEM CONTROL**

6.10.1 **Material Control**

All supplies shall be homogeneous as defined below. Violation of this requirement may require a First Article.

Homogeneous supplies are defined as material produced:

A) To the same design as defined by ATK and supplier documentation.

B) From the same material as defined by the applicable material specification. After material has been submitted to ATK, the supplier may not change to alternate materials without prior written approval from ATK.

C) By the same manufacturing process as defined by the supplier's Production Process Documentation (PPDs). Changes in the PPDs or order of operations may violate this requirement (reference paragraph 6.5.2). Changes in manufacturing location violate this requirement, and unless waived by ATK, production discontinuities of over 90 days.

D) Using material, products, special processes (such as metal finishing, heat treat, etc.) from the same suppliers. Changes in suppliers violate this requirement. ATK must be notified if you intend to change suppliers. ATK reserves the right to disapprove your supplier selection.

Bi-directional traceability of material must be documented and maintained throughout the production process to the extent required herein and by the TDP.

6.10.2 **Certified Material Test Reports (CMTRs)**

Certified Material Test Reports are required for all materials with chemical and/or physical requirements specified on the individual drawings or in the ASTM/material specifications referenced on the drawings. CMTR's shall be submitted to ATK upon request. Copies of CMTR's shall be included with every First Article/PCA.

Inspection procedures need to be established to verify conformance of the CMTR to the specification requirements. The results contained on the certified test report shall be adequate to determine compliance with all applicable material specification requirements.

Availability of the certified test reports is in addition to other subcontract requirements and does not reduce or prejudice ATK's or the Government's right to inspect supplies under other provisions of this contract.

Unless otherwise directed by ATK, certified material test reports must contain the following:

A. Name and address of supplier (of the material).
B. Purchase order number (issued to the supplier) or lot identification.

C. Identification of material by specification/QAP, revision, and dates, together with type, grade, size, etc.

D. Quantity of material.

E. Actual test results identified by reference to the applicable requirements. Blanket statements are not acceptable.

F. Quantity tested, sample size, and specimen type as applicable.

G. Dated correspondence with a signature and/or title of the authorized representative of the supplier that is attesting to the accuracy of test report content.

6.11 INSPECTION PLAN

You must perform, as a minimum, the examinations and tests in accordance with specifications, prints and all applicable provisions of the TDP. An inspection plan documenting the inspections and tests that will be performed on the product at various levels of manufacturing and assembly must be submitted to ATK for approval. A compilation of your actual inspection / test procedures and forms for recording the inspection / test data is the preferred content of the inspection plan. The inspection plan must include the following information:

- Part number and revision
- Characteristic description
- Characteristic classification number, if a numbering system is in use
- Reference to a sample plan or chart (or a sample size, accept number and reject number)
- Acceptance Inspection Equipment to be used
- Data recording instructions
  - All inspection measurements must be recorded to one more significant digit than that of the specified dimension.
- The manner in which lot formation will be determined for product submissions
- Your approach for assuring unlisted characteristics conform to requirements

The chronological listing of the following information is required to ascertain the completeness of the inspection plan:

- Detailed flow diagram of the material flow through the various manufacturing/processing/inspection operations. The flow chart must show inspection and test points for all listed and key characteristics.
- Identification of in-process and operator inspection points.
- Identification of SPC and other process control points.

The flowchart submitted as part of the Production Process Documentation (ref. paragraph 6.5.4) may be used to satisfy this requirement if the information identified above is included.

Revisions to the inspection plan must be approved by ATK before use.

6.12 ACCEPTANCE INSPECTION EQUIPMENT
6.12.1 Supplier Gaging

You are responsible for the design, fabrication or procurement, maintenance and calibration of all acceptance inspection equipment. The product will be measured in the units in which it is dimensioned. Metric gaging for listed metric dimensions is mandatory - no conversion is permitted. All Acceptance Inspection Equipment must be accurate to a minimum of 10% of the range of the dimension measured. All inspection equipment must be capable of measuring to one more significant digit than that of the specified dimension. A gage R&R must be submitted to and approve by ATK prior to use.

Automated Acceptance Inspection Equipment (AAIE) shall use fail-safe designs in which the decision making logic and the material handling devices normally operate in a reject mode until an accept mode signal is received.

6.13 SOURCE INSPECTION

6.13.1 ATK Source Inspection

ATK maintains the right to perform source inspection and/or source surveillance to evaluate the product or service being procured by this purchase order/subcontract. If material cannot be shipped without ATK inspection and approval, it will be reflected on the ATK purchase order. ATK may choose to waive source inspection but any such waiver will not jeopardize future opportunities for source inspection.

Before submitting product to ATK, it shall have been accepted under the terms of your inspection plan. Your inspection and test records shall, as a minimum, indicate the nature of the observation made and the number and type of deficiencies found. Data included in inspection and test records shall be complete and accurate, used for trend analysis and used to assess corrective action effectiveness. Your calibration of measuring and testing equipment shall, as a minimum, adhere to the requirements of ANSI/NCSL Z540-1 or an industry equivalent acceptable to ATK.

If material can be shipped without ATK inspection and approval, it will be reflected on the ATK purchase order. ATK reserves the right to make final acceptance of the product or service.

In either case, product and process audits may be performed on items affecting product quality such as:

- Acceptance Inspection Equipment (AIE)
- Calibration
- Special Processes
- Work Instructions
- Process Control (including SPC)

Reasonable facilities and equipment shall be made available to the ATK quality representative while performing these tasks. Adequate facilities shall include items such as a desk, telephone, files, copier, and fax machine. Access must be provided to appropriate work areas, AIE, records, inspection/quality plans, etc.
If Government inspection is **required** prior to shipment from your plant, it will be reflected on the ATK purchase order.

### 6.13.3 Government Source Surveillance

If Government inspection prior to shipment or release of product **is not required but the Government reserves the right to inspect at their convenience**, it will be reflected on the ATK purchase order.

In the event that product discrepancies are found and documented by a Government QAR in the form of a Corrective Action Request (CAR), you must forward a copy of the CAR to the ATK Subcontractor Administrator immediately upon receipt.

### 6.13.4 Use of supplier facilities and supplier assistance

For either ATK inspection or Government inspection the supplier must provide the facilities and assistance necessary for access to the product and for measurement, test and inspection of the product in accordance with inspection procedures. All gages, AIE and AAIE must be made available for these inspections if requested.

### 6.14 CONTROL OF SAFETY (CRITICAL) DEFECTS

The requirements of this paragraph apply only if the item you are supplying contains critical or safety characteristics. If critical or safety characteristics apply, the ATK Buyer will provide you with a listing of these characteristics.

#### 6.14.1 Critical Defect Program Requirements

The requirements for the control of critical defects (CDs) stated herein apply at your facility as well as any of your suppliers having processes that may produce critical defects. If the components or processes are fully or partially produced / performed at your supplier, all aspects of paragraph 6.14 must be flowed down in your purchase order to this supplier.

Your production processes shall be designed to prevent the creation of a critical defect.

A characteristic classified as critical shall be checked a minimum of 100% using non-destructive test methods. Additional 100% checks may be required. The total number of 100% checks shall be based on the number needed, at the 90% confidence level, to achieve a defect escape rate of less than one in a million in the end-item ATK delivers to our customer. To accomplish this, the defect escape rate for any individual critical characteristic may need to be less than 1-in-1 million. The ATK Buyer will provide you with the maximum defect escape rate allocated to you for each critical characteristic.

Your Material Handling System and procedures must be designed to ensure that materials with critical non-conformances are immediately segregated from conforming product and cannot be cycled back into the process under any condition including power outages, or line shutdowns for any reason.

You are required to prepare a Critical Defect Control Plan addressing each critical characteristic for which you and your suppliers are responsible. This plan must be
approved by ATK prior to producing product and may not be changed without the prior approval of ATK.

Critical characteristics are also key characteristics. The control requirements for key characteristics stated paragraphs 6.7 and 6.8 apply.

### 6.14.2 Critical Defect Control Plan

The Critical Defect Control Plan shall address the following:

- A flowchart of the process identifying in-process screens, inspections and tests; and identification of all material handling devices (automated and manual) including load/offload points
- Controls used at accept/reject stations to ensure mixing of conforming and nonconforming material cannot occur.
- Identification of each failure mode, which could inadvertently permit material with a critical nonconformance to leave the plant as “acceptable” product and methods employed to prevent the occurrence of each failure mode.
- Complete explanation of potential failure modes together with supporting historical information and statistical data.
- Pre-established plan of action to be taken when a Critical Nonconformance occurs and a description of controls to ensure there is no possibility of the nonconforming item inadvertently reentering the production process.
- Method for identification and traceability of items being manufactured which contain critical characteristics and items with critical non-conformances.
- Reference to all operating procedures of the system, including manufacturing inspection, record keeping, handling of nonconforming material, and material handling equipment operation, under all conditions (normal operation, power failure, recall, etc.).
- Means of tracking nonconformance rate, investigative results, and corrective actions taken.
- Means of establishing and tracking control system effectiveness for preventing critical defect escapes into delivered product.
- Method to immediately verify that a produced Critical Nonconformance is consistent with the identified failure modes and does not exceed the historical nonconformance rate.
- Provisions for ensuring that the process that produced the critical nonconformance is immediately stopped
- The nonconforming items are positively identified, rendered unusable and segregated
- ATK is immediately notified of the occurrence of a Critical nonconformance
- Any suspect material is identified, segregated and suspended from further processing
- An investigation is conducted to determine the cause of the nonconformance and the positive corrective action taken to prevent further occurrence.
  - A report of the investigation shall be submitted to ATK
- An investigation is conducted on suspended suspect material to ensure that it is free of any critical nonconformance
  - A report of the investigation shall be submitted to ATK

**System Effectiveness:** System effectiveness shall be determined at a 90% confidence level using the expected defect rate as the submitted quality level SQL into the in-line critical defect inspections and tests. Station mastering or industry standards determine individual inspection and test station effectiveness. Examples are: single attribute visual inspection 85% effective, multiple attribute visual inspection 75% effective, AAIE station qualified with 460 submitted reject masters 99.5% effective, AAIE in process mastering with 3 reject masters 3 times
per shift 98% effective etc. Gages must be qualified by demonstrating the maximum allowable error rate is not exceeded at a 90% confidence level.

System Effectiveness for each critical defect shall be baselined and tracked through the duration of the contract. System Effectiveness for each critical defect shall be reported weekly in the Process Control Report as the “potential for escapes in parts per million.” Defect rates for each critical characteristic must be determined and reported weekly and corrections made to system effectiveness based on changes in the defect rate. ATK has an Excel tool for calculating system effectiveness available upon request.

Restart of production or use of suspect material may not occur unless authorized by ATK unless allowed by a pre-approved alternate production restart plan.

6.14.3 Alternate Critical Defect Production Restart Plan

If a process has the known potential of generating a critical defect, an alternate production restart plan may be used if the defect mode and defect rate are consistent with the pre-established expected defect modes and defect rates and the plan has been pre-approved by ATK and the Government.

6.14.3.1 Control Procedure

If the alternate production restart methodology has been implemented and a critical defect is discovered, the supplier may authorize the continuation of production and the use of affected product provided that the failure mode exhibited by the defect has been pre-identified, the defect rate has not been exceeded and actions are in accordance with the approved plan.

For any occurrence of a critical defect wherein these conditions are not met, production of affected operations must be stopped and suspect product suspended as stated in 6.14.2.3.

6.14.4 Control of Critical Defects During Process Startup or Tooling Changes

Parts manufactured during tooling changes or process startup must be kept segregated. Quality will inspect all parts and record the number of critical defects. The defective parts will be rendered unusable by a method pre-approved by ATK and scrapped (unless reworkable w/ ATK concurrence). Acceptable parts may be returned to the production flow at the same point at which they were removed. The Quality Manager/Director or his designated representative shall approve the process for production startup.

6.14.5 Contractor Identified Critical Characteristics

In addition to listed critical characteristics, you are obligated to identify and document any other product characteristics that may present a hazard to anyone using, handling or maintaining the product. The contractor shall classify the following as critical:

a. Any characteristic that in the event of a non-conformance will result in a hazardous or unsafe condition (often referred to as a single point failure).

b. Any characteristic that in the event on a non-conformance will remove or degrade a safety feature (such as those in a safe and arm device or a fuzing system).

c. Any characteristic that in the event of a non-conformance will result in violation of mandatory safety policies or standards.
Submit any additional critical characteristics to ATK for review by the Government. Government review must occur prior to the start of production. After Government review, characteristics determined to be critical must be added to and managed in accordance with critical defect control plans.

6.15 NONCONFORMING MATERIAL

ATK will maintain material review board (MRB) authority for all characteristics for this contract. Potential material review actions such as repair, rework (unless previously approved by ATK), and use-as-is must be submitted to ATK for MRB action. Your MRB only has the authority to scrap, sort, perform reprocessing, and perform rework in accordance with a rework procedure approved by ATK.

6.15.1 Definitions/Requirements

6.15.1.1 Repair:

Additional operations performed on a nonconforming article or material to place it in a usable, but still nonconforming condition. A written repair procedure is required. Requests for approval of repair procedures must include a description of the cause of non-conformance and a description of actions to prevent recurrence. Approval of the repair procedure must be obtained from ATK prior to its use, and the product may not be accepted until such approval is obtained by ATK.

The repair procedure shall contain a provision for re-inspection which will take cognizance of the TDP requirements and also shall provide for inspection of any variance which may be introduced as a consequence of the restoration method.

Note: Many prime contracts do not allow repair. Those contracts that allow repair do so only under a Government approved Deviation. ATK reserves the right to refuse acceptance of any parts requiring deviation.

6.15.1.2 Rework:

The processing of nonconforming material through a process that is different than that which is applied to virgin material to return it to a fully conforming condition.

If the nonconforming material is re-run as-is through the original, standard documented process, it is considered to be reprocessed, not reworked. Refer to paragraph 6.15.1.3.

Additional written work instructions are required for rework. Rework procedures must be approved by ATK prior to implementation. Requests for approval of rework procedures must include a description of the cause of non-conformance and a description of actions to prevent recurrence. The rework procedure shall contain a provision for re-inspection of the non-conformance to provide assurance that the non-conformities have been removed. In addition, the re-inspection shall provide for inspection for variation in any feature which may be introduced as a consequence of the restoration method.

Note: Most prime contracts require Government approval of rework and re-inspection procedures. Adequate time must be provided for ATK and Government review and approval. Standard rework procedures may be submitted for approval in advance if the need to use them during the contract is anticipated.

6.15.1.3 Reprocessing:
Material which is found to be nonconforming and is re-run as-is through the original, standard, documented process to return it to a fully conforming condition. Reprocessed material must be re-inspected with the approved inspection procedure to verify the non-conformity has been eliminated. You are not required to notify or obtain ATK approval for the re-processing of nonconforming material.

6.15.4 Scrap:

Your MRB only has the authority to scrap material that is owned by you and is not ATK or Government furnished material.

6.15.5 Use As Is:

Material which has one or more characteristics that do not meet the drawing/specification/QAP requirements, but evidence can be produced to support a basis that the material is still acceptable for use. Such material shall not be used unless written approval from ATK is provided.

Note: Most prime contracts do not allow Use-As-Is. Those contracts that allow Use-As-Is do so only under a Government approved Deviation. ATK reserves the right to refuse acceptance of any parts requiring a deviation.

6.16 REPORT OF QUALITY OF CUSTOMER FURNISHED MATERIAL (CFM)

Defects that render product furnished to you by ATK (CFM) unusable, either as-received or as a result of processing, will be reported to ATK. The report will include the type of defect and associated rate or quantity and be provided at the end of the lot in which it occurs.

6.17 RECORDS RETENTION

Quality records shall be retained for six years after final payment against the subcontract/purchase order.

6.18 PACKAGING AND SHIPPING INSTRUCTIONS

6.18.1 Container Weight

Human-carried individual containers must have a gross weight of 25 lbs. or less and reusable palletized containers should be used whenever possible to minimize disposal costs. If existing packaging does not meet these requirements, you must provide justification to the ATK Buyer and obtain approval prior to delivery.

Human-carried packages exceeding 25lbs. must be clearly labeled with the actual container weight and must have handhold cutouts to provide for proper ergonomic lifting as identified by U.S. Department of Labor, Occupational Safety and Health Administration.

6.18.2 Labeling

You must follow the “Standards Practice for Commercial Packaging,” ASTM designation number D 3951-98, as a minimum, and apply the highest quality industry standards for packaging to ensure there is no degradation of material
quality during shipping. In addition, each unit package and shipping container must be labeled with the following information:

- Name/description of item
- Item number and revision
- Supplier lot number and lot quantity
- Quantity per container and number of containers
- Supplier name
- Purchase order number

6.18.3 Data Sent with Shipment

Unless specifically directed otherwise, a copy of inspection results and, if applicable, the ATP report must be included with each shipment.

6.19 ADDITIONAL CONTRACT AND PRODUCT-UNIQUE REQUIREMENTS

6.19.1 PRODUCTION COORDINATION MEETINGS

6.19.1.1 Build Readiness Review (BRR) meeting

As part of this contract a BRR meeting is required by ATK prior to the start of production. The ATK product engineer has responsibility for the planning and direction of the meeting. The meeting notice will be sent a minimum of 5 working days prior to the meeting. The supplier is required to participate in the BRR meeting, either in person or by telephone. If you have subtier subcontractors they may be required to attend the BRR.

The purpose of the BRR meeting is to review the following:

- Build objectives
- Technical data package
- Build planning
- Build schedule

A checklist of items that will be reviewed will be forwarded to the supplier by the responsible ATK engineer at least 4 working days prior to the meeting.

6.19.1.2 Consent To Ship (CTS) meeting

As part of this contract a CTS meeting is required by ATK prior to each shipment. The ATK product engineer has responsibility for the planning and direction of the meeting. The meeting notice will be sent approximately 2 working days prior to the meeting. The supplier is required to participate in the CTS meeting, either in person or by telephone. The supplier is responsible for providing the ATK product engineer with a copy of the lot inspection data as required by the QAP, including In-Family Data Management information, prior to the issuance of the CTS meeting notice.

The purpose of the CTS meeting is to review the following:

- Manufacturing data. This is to insure product quality and conformance to the TDP. The supplier may be asked to provide explanations for out-of-family data as deemed appropriate by the ATK product engineer. This will not result in rejection of in-spec parts, but is intended to increase understanding of how manufacturing process variations affect performance.
- CMTR’s, C of C’s, etc.
- Shipping documents/authorizations
- Hardware status
- Shipping planning/coordination

A checklist of items that will be reviewed will be forwarded to the supplier by the ATK product engineer at least 2 working days prior to the meeting.

6.19.2 AMMUNITION DATA CARDS

Unless directed otherwise, ammunition data cards (ADCs) shall be prepared and submitted in accordance with MIL-STD-1168B, DI-MISC-80043 and the supplemental instructions below for every shipment of product via the WARP system. New suppliers must submit a sample ADC to ATK, who will supply it to the customer for review. If directed by ATK, ADCs must be submitted to the ATK source inspector or Product Engineer for review prior to shipment of the product.

The signature of your local QAR is required on all ADCs via WARP. You must coordinate with your local QAR to establish a mutually agreeable process for obtaining this signature in a timely manner.

A final ADC is required for each lot and must reflect all reportable associated activity such as waivers/deviations, ECPs, reason for interfix number changes, etc. Refer to MIL-STD-1168B for a more detailed listing. The final ADC should list the total lot quantity (total quantity shipped) in the "net quantity" block which includes the ballistic LAT/IPT samples. Information on the number of ballistic LAT samples and where shipped must also be shown in the "test samples" block. If the final ADC is for an item which has no ballistic test requirement in the component/subassembly specification, the "disposition" block typically should state “Accepted”. If the component/subassembly specification requires a ballistic test, the final ADC should typically state “Provisionally Accepted.” Note: A ballistic test that is “advisory” in the specification is not considered a required test.

With each shipment (LAT sample, partial, pre-released quantity or complete lot), 1 copy shall accompany the shipment.
### PROCESS CONTROL DETAIL PLAN

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Class of Char</th>
<th>Method of Measurement</th>
<th>Control Method</th>
<th>Sample Size</th>
<th>Sample Freq.</th>
<th>Op Number</th>
<th>Control Method Rationale</th>
<th>Stable (Y/N)</th>
<th>Typical Cpk</th>
<th>Typical Cv</th>
<th>Comments</th>
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**ATTACHMENT 1**

**Program**

**Supplier Address**

**Approvals**

**Date**

**PART DESCRIPTION**

**Revision Date**

**Supplier**

**ATK**
Attachment 2

In-Family Data Management

The objective of in-family data management for key characteristics is the timely identification of conditions and product that are significantly different than normal so that action can be taken to identify and mitigate potential risks. Differences considered significant may be flagged in several ways:

- New data that lies outside of 2-sigma values calculated from historical data can signal an abnormal shift in a process. In a stable process, values outside of 2-sigma occur due to chance only 5% of the time. By acting on data outside of 2-sigma, there is a very good chance of catching a problem before it has the opportunity to cause even larger problems.
- The appearance of new failure modes and unusual product anomalies can signal a change with the potential to cause significant problems.
- An unexpected shape in a data distribution or trends in data can also indicate process instability with the potential to create significant problems.

The Monthly Process Control Report (reference Section 6, paragraph 6.7.5) will be used as the primary tool to enable in-family data management. To accomplish this, changes in the way data is formatted and communicated are necessary. A standard report format based on Microsoft Excel and control charts for individuals (XmR charts) will be used to make in-family analysis easier. An internet-based process for more efficiently updating and communicating the report will be used, and renewed emphasis will be placed on the availability of near real-time data. Although there will be increased standardization, there remains room for tailoring reports to meet the needs of the supplier and ATK. The remainder of this document describes ATK’s in-family data management initiative and changes in the Process Control Report.

In-Family Management of Attribute Characteristics

1. For an attribute characteristic (counted/discrete data), whether controlled by SPC or not:
   - The percentage of product rejected* during the reporting period is entered by the supplier directly into an Excel template provided by ATK that generates XmR control charts
   - In addition, unusual observations during the reporting period associated with the characteristic are documented in a data summary template provide by ATK

*If accurate counts are unknown, quantify the percent rejected using the following table.

<table>
<thead>
<tr>
<th>Reject Rate</th>
<th>Control chart value</th>
</tr>
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<tbody>
<tr>
<td>Much greater than normal</td>
<td>5</td>
</tr>
<tr>
<td>Greater than normal</td>
<td>4</td>
</tr>
<tr>
<td>Normal</td>
<td>3</td>
</tr>
<tr>
<td>Less than normal</td>
<td>2</td>
</tr>
<tr>
<td>Much less than normal</td>
<td>1</td>
</tr>
</tbody>
</table>

In-family behavior (see Data Analysis) is determined by analyzing the XmR control chart for individuals and the operator/inspector observations.
In-Family Management of Variables Characteristics

1. For a variables characteristic (measured/continuous data) not controlled by SPC and:
   a. A single inspection/test is performed per batch or lot:
      • The result of the inspection/test performed on each batch or lot during the reporting period
        is entered by the supplier directly into an Excel template provided by ATK that generates
        XmR control charts
      • In addition, unusual observations during the reporting period associated with the
        characteristic are documented in a data summary template provided by ATK
   b. Multiple samples are inspected / tested for each batch or lot:
      • Preferred method – A histogram for the data generated during the reporting period showing
        capability and basic statistics is pasted as an object into an Excel worksheet. More than one
        histogram is desirable if there are multiple lots or batches.
      • Alternate method - For all samples inspected / tested during the reporting period, a single
        batch/lot value for the statistic (max, min, mean, standard deviation, etc.) most likely to flag a
        potential downstream performance problem is entered by the supplier directly into the XmR
        control chart template
      • In addition, unusual observations during the reporting period associated with the
        characteristic are documented in the data summary template

In-family behavior (see Data Analysis) is determined by analyzing the histograms or XmR control
charts and the operator/inspector observations.

2. For a variables characteristic controlled by SPC (e.g. X bar and R chart) at the point of
   manufacture:
   • A histogram of the data generated during the reporting period showing capability and basic
     statistics is pasted as an object into an Excel worksheet and the corresponding Cpk for the
     reporting period is entered into an Excel template for XmR control charts provided by ATK
   • In addition, unusual observations during the reporting period associated with the characteristic
     are documented in a data summary template provided by ATK

In-family behavior (see Data Analysis) is determined by analyzing the histogram, the X run chart only
and the operator/inspector observations.

Data Analysis

1. Product associated with new data is not in-family when:
   a. The value displayed on the Xmr chart:
      • Lies outside the 2-sigma range of historical data as displayed on the XmR charts (n/a for Cpk)
        or
      • Lies beyond the historical maximum or minimum values of product known to have no
        downstream performance problems (n/a for Cpk) or
      • Adds to a trend suggesting problems are likely to occur in subsequent product if no action is
        taken to further analyze the data or the product
   b. The shape of the distribution or variability of data displayed on a histogram:
- Is not as expected or adds to a trend suggesting problems are likely to occur in subsequent product if no action is taken to further analyze the data. The data should reflect a stable, capable process (less than 1 PPM, given a sufficient amount of data), or
- Shows points beyond the historical maximum or minimum values of product known to have no downstream performance problems

c. New failure modes or unusual observations occurred and these conditions are likely to cause problems if no action is taken to further analyze the data or the product

2. Product associated with new data is in-family when:
   a. None of the above conditions apply.

**Action required**

1. When new data is not in-family, the ATK component engineer and supplier will discuss the data, and the component engineer will consult with the Process Change Control Board to determine the appropriate response.

2. When new data is in-family, no action is required.
Getting Started

Step 1. Prepare the forms and XmR chart templates
- Prepare a summary worksheet listing each key characteristic to record new failure modes, unusual observations and dates new data is added. If multiple work cells are used to create key characteristics, each work cell should be listed separately.
- Prepare XmR chart templates by adding labels, upper and lower specification (or engineering) limits and historical max and min values for product known to have no downstream performance problems. If multiple work cells are used, a separate template should be prepared for each work cell. Each XmR template should be placed on a separate worksheet.
- Create worksheets that may be needed for histograms.
- If desired, create a worksheet listing each key characteristic to record and organize raw process control data before it is pasted into other worksheets.

Step 2. Initially populate the templates and worksheets with historical data to create a baseline
- Twenty data points are desired to create a good XmR control chart. Data may be added directly into the shaded areas of the fill-in-the-blank control chart templates or first organized in a separate worksheet and then pasted into the shaded area. Points on the charts will be automatically plotted as the data is entered.
- Twenty histograms are desired to form an historical family of data to compare with new data. Histograms may be pasted into any open area of a worksheet and organized.

Step 3. Upload the Excel file(s) containing the worksheets to Teamcenter Community ensuring all key characteristics are addressed. This is the Process Control Report.

Step 4. Update the Process Control Report at the submittal frequency stated in the purchase order
- Download the last Process Control Report from Teamcenter Community.
- Update the summary sheet and add new data to the worksheets. Maintain XmR charts so that 20 to 50 data points are displayed and maintain appropriate worksheets so they contain 20 to 50 histograms. If no new data has been generated during the reporting period, a comment must be entered on the summary sheet. At this time, the chart owner may also wish to update the optional data worksheet to maintain a record of activity for all time intervals, even those without data.
- The XmR template can accommodate up to 50 entries. When this limit is reached, replace the existing data with new data containing the 50 most recent data points by pasting over the old data.
- Charts that can display more than 50 data points are available and will be provided upon request.