



0299 Supplier Supplement

Revision "IR"

10/25/2018

REVISION RECORD

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REVISION SUMMARY

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"IR" 10/25/2018	All	New Document Release.

CONCURRENCE

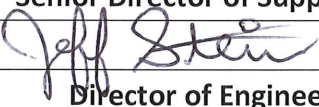


Senior Director of Supply Chain		Director of Quality
		
Director of Engineering		
		

Table of Contents

Overview	1
A. General Requirements for Controlled Items.....	1
1. Program Engineering	1
2. Program Administration	1
3. Program Manufacturing / Process Planning.....	1
4. Records	2
B. Manufacturer Requirements for Controlled Items.....	2
1. Traceability / Serialization	2
2. Manufacturing Process Review and Approval.....	3
3. Purchasing	4
4. Manufacturing Verification	5
5. Inspection, Testing, and Documentation	5
6. Material Review of Non-Conforming Parts	7
7. Shipping Identification.....	8
C. Process Source Requirements for Controlled Items	8
1. Traceability / Serialization	8
2. Process Planning Review and Approval.....	8
3. Purchasing	8
4. Processor Verification.....	8
5. Inspection	9
6. Material Review of Non-Conforming Parts	9

Overview

This supplement defines the procedures for complying with the Erickson Specification 0299, Requirements Specifications – Bell 214B/B-1/ST Controlled Item Parts Program.

Erickson Quality is responsible for coordinating the approval of this supplement. Any subsequent revisions to this procedure shall also be submitted for approval prior to implementation.

A. General Requirements for Controlled Items

1. Program Engineering

- a) The appropriate controlled item designation is clearly notated on engineering documents.
- b) In cases of conflict between the requirements of this document and the Engineering documentation, the engineering requirements shall take precedence.

2. Program Administration

- a) All suppliers receiving Erickson purchase orders for the manufacturing of controlled items and/or processing operations for controlled items must be approved by Erickson.
 - (1) Supplier shall establish and document a program within their Quality Management System that implements the applicable requirements and controls required within this supplement. The documented procedure must be submitted to Erickson Quality for review and approval prior to "Controlled Item" approval status being granted. Any subsequent revisions shall also be submitted for approval prior to implementation.

NOTE: If a supplier has an existing controlled item program meeting the minimum requirements of Bell SQRM-001 Appendix VI, Erickson will grant controlled item status upon receipt of their existing program.

- (2) All documents applicable to controlled items (i.e. manufacturing, processing, procurement, quality, shipping, etc.) shall have clear notation of the item's designation ("Primary", "Critical", "Flight Safety", or composite item designated as "Makes a Critical") on each page of the document.
- (3) All documents (e.g. manufacturing planning, inspection records, purchasing documents, rejections, etc.) where "Significant" or "Critical" characteristics are noted shall identify these characteristics. A Significant characteristic shall be identified by the inverted triangle symbol "▼" or by clear annotation that characteristic is "significant". A Critical characteristic shall be identified on all documentation by the diamond-C symbol "◈" or by clear annotation the characteristic is "critical".

Raw casting or forging characteristics that are critical will be shown on the finished item drawing. The characteristic will have a note stating it will be a critical characteristic on the finished controlled item.

3. Program Manufacturing/Process Planning

- a) A written plan in English outlining each manufacturing, processing, assembly or installation operation/process resulting in a controlled item shall be submitted to the applicable Buyer for approval and FREEZING by the appropriate Planning Review Board (PRB) prior to first delivery of a controlled item.

NOTE: For Fatigue Controlled Castings/Forgings/Extrusions, exemption to frozen planning requirements shall be defined by the 299-100-840 specification, Casting/Forging/Extrusion Process Procedures for items designated as Fatigue Controlled that are submitted to and approved by engineering as part of the First Article Qualification approval process shall be considered as frozen planning for these items.

- b) After initial PRB approval, the detailed written manufacturing planning, product traveler and Inspection Check Sheet are considered "FROZEN". Any changes to "FROZEN" documents, including sequencing, other than those noted below must be submitted for approval by Erickson PRB.
 - (1) Changes to update engineering revision status having no impact on product being controlled by planning.
 - (2) Change from one piece of equipment of the same manufacturing type to another, providing the change does not alter the manufacture as established by the initially approved planning package or alter the programming, tooling, methodology, etc. Changing from one method of manufacturing to another is not permissible without prior approval through Erickson PRB.
 - (3) Additional inspection sequences,
 - (4) Revised or changed tooling identification,
 - (5) Relaxed tolerance dimensioning when authorized by Erickson Engineering,
 - (6) Tightened tolerance dimensioning,
 - (7) Typographical errors,
 - (8) Minor dimensional machining revisions of planning to semi-finished attributes to allow for clean up or to compensate for process (including tooling) variation.
- c) PRB approved manufacturing or process planning documents shall be annotated as "FROZEN" and shall note that any changes must be approved by the PRB.
- d) Only the "FROZEN" planning being revised must be submitted for PRB approval, e.g. change to a sub-tier process plan must be re-submitted but does not in-and-of itself require re-submittal of the actual part manufacturing plan and vice versa. Suppliers are required to submit sub-tier supplier planning to Erickson PRB for approval on all frozen planning.
- e) PRB approval of planning is not to be considered as authorization for deviation from applicable engineering requirements. Any planning instruction that deviates from engineering requirements shall be corrected and resubmitted for PRB approval.

4. Records

Manufacturing and Quality records for controlled items are to be maintained for 10 years from completion of applicable contract and are available for review.

B. Manufacturer Requirements for Controlled Items

1. Traceability/Serialization

- a) Supplier must have a system providing controlled part traceability originating at the specific lot or batch of raw material, heat lot, or X-Ray number for castings and going forward to the final product supplied to Erickson.
 - (1) Traceability shall be maintained throughout manufacturing, processing, assembly and installation operations forward to the Suppliers shipping document.
 - (2) Items designated as "Primary" only and not designated Primary Part traceable or items designated as "Fatigue Controlled Parts" only are required to maintain traceability to the extent required to assure compliance to engineering requirements.
 - (3) Metallic wrought materials (bar, plate, tube) per Industry, Military or Federal specifications used in the manufacturing controlled items designated as "Primary", "Critical", or "Flight Safety" shall be procured from sources approved to and listed in 299-100-837 "Requirement Specifications – Approved Metallic Materials Source List". This requirement does not include casting, forgings, forging stock, Bell part numbered extrusions, Bell Material Specification metals (e.g., 299-947-XXX), or supplier designed components.

- (a) Castings, forgings and composite parts that "Make a Controlled Item" (except "Primary" parts) shall have traceability from raw material through processing and manufacturing operations to a completed item. For castings and forgings where engineering requirements do not include serialization, traceability may be by heat lot number or x-ray number.
- (b) Items designated as "Makes a Primary" are required to maintain traceability to the extent required to assure compliance to engineering requirements.
- (4) In-process product is identified throughout manufacturing via customer orders, operation instruction sheets and identification tags to ensure visibility, identification and process continuity.
- (5) All documentation and traceability information are carried forward to final inspection/certification and are incorporated into Erickson's shipping documentation.
 - (a) Parts shall be individually identified by the use of unique serial numbers when required by BPS4050, Marking Aircraft Parts.
 - (b) Serial numbers may be assigned by Erickson as part of the PO. If serial numbers are not assigned via the PO, Supplier may use serial number from their internal system provided the serial numbers are non-repeating.
 - (c) Serial numbers must be applied at the earliest possible operational sequence, and transferred in the event of subsequent removal. Supplier shall perform inspection immediately after transfer of serial numbers to verify correct serial number is transferred.
- (6) Serialization is recorded and maintained on all applicable manufacturing, purchasing, inspection and certification documents.
- (7) Serialized parts subcontracted by Erickson are controlled to assure accountability of quantities and traceability as to specific operations performed by each sub-tier source involved via Erickson purchase orders. Certifications received from sub-tier sources must reflect the product serial numbers.

2. Manufacturing Process Review and Approval

- a) Planning for controlled items shall be submitted to the buyer for written Erickson PRB approval using the Erickson business to business (B2B) internet portal. Submittal must include all supplier planning requirements noted below and the inspection check sheet for the part number being submitted.
- b) Erickson shall be notified in writing of each planning document's initial release and subsequent revision thereof either in writing to the applicable buyer and through electronic submittal into the Erickson business to business internet portal. Notification to include the following as a minimum:
 - (1) Suppliers name & physical address
 - (2) Part Number
 - (3) Drawing Number
 - (4) Drawing & Parts List Revision
 - (5) Planning Revision & Date (MM-DD-YY)
 - (6) Inspection Check Sheet Revision & Date (MM-DD-YY)
- c) Manufacturing plan and/or process sheets for all operations to be performed shall reflect the following as a minimum:
 - (1) Notation on each sheet of planning document, i.e. "Primary", "Makes a Critical", "Critical", "Flight Safety".
 - (2) Manufacturers/processor's name and physical address.
 - (3) Planning revision level and/or date.
 - (4) Planning Revision History Record Sheet showing initial release and reason for subsequent revisions.
 - (5) Part number, complete with dash number.

- (6) The drawing revision letter, parts list revision level and any applicable Engineering Order numbers to which the finished item must comply.
- (7) The material used, including the applicable specification numbers, and provisions for verification of the correct material by supplier inspection personnel.
- (8) When an assembly, the identification of each controlled item part number contained within the assembly.
- (9) Sequential manufacturing, processing, test, and inspection operations, including sequencing options, with provisions for indicating acceptance or rejection and date of accomplishment for each operation.
NOTE: See requirements for special process planning defined elsewhere in this document.
- (10) Significant "▼" or critical characteristic "◆" identification at each point the characteristic is noted on the planning.
- (11) Provisions for recording traceability/serial numbers.
- (12) Equipment, tooling, fixtures, jigs, templates, etc. to be used.
- (13) Required special instructions or caution notes
- (14) Sketches, diagrams or supplemental instruction sheets used in the manufacture of the part.
- (15) Special packaging, preservation and identification requirements, including provisions for preservation and protection of products to sub-tier suppliers or special processors.
- d) For operations planned by the Supplier to be performed by sub-tiers, including special process sources, a copy of the sub-tier's technique documentation must be included as a part of the manufacturing plan submitted to the PRB for approval.
 - (1) Operations for outside processing, must include name(s) and physical address(s) of sub-tiers to be used.
 - (2) Sub-tier planning and/or technique documentation must include their customer's name (the firm contracting for the work to be performed or service provided).
 - (3) Erickson PRB will review the sub-tier planning for general layout and compliance to this supplement.
- e) Planning for controlled assemblies containing controlled detail items will include a listing identifying each controlled part number and serial number, if applicable.
- f) Manufacturing operations for controlled items offloaded by suppliers are to be performed per supplier manufacturing planning. Any planning changes requested must be approved by Erickson PRB prior to incorporation.

3. Purchasing

- a) Supplier may subcontract controlled items to sub-tier sources for complete manufacture, individual manufacturing operation(s) or performance of special processes/NDI.
 - (1) Sub-tier controlled item manufacturing and process sources used by suppliers must be approved by Erickson. The list of approved suppliers is maintained on Erickson's B2B portal
 - (a) Exception: Suppliers sub-tier sources for "rough machining" do not require approval but the "rough machining" operations must be included in the "frozen planning." Acceptable rough machining methods include conventional, high speed, and electrical discharge machining as well as chemical milling, shearing, water jet cutting, and mechanical cutting (i.e. band saw with toothed cutting blade). It is not acceptable to use grinding, abrasive cutting, plasma cutting or flame cutting for rough machining of designated product.
 - (b) After rough machining operations are completed, a minimum of 0.100 inch of material shall be removed from all rough machined surfaces by final machining (as controlled by frozen planning and conducted by an Erickson approved source of supply). In order to ensure that 0.100 inch of

material is removed during final machining operations, at least 0.100 inch of material should remain after rough machining considering the maximum material condition of the part. Under no circumstances should less than 0.100 inch of material be removed from rough machined surfaces during final machining.

- (2) Suppliers providing a controlled item designed by the supplier and manufactured to a supplier part number must approve manufacturing and processing sub-tier sources to the requirements contained within this supplement. Sub-tier source surveillance must be used to the extent necessary to ensure program compliance. Changing a sub-tier source requires revision to frozen planning and inclusion within the change notification sent to Erickson as required by the manufacturing planning requirements.

Supplier sub-tier sources for either completed designated product or for individual manufacturing operations that involve "Critical" characteristics must be approved by Erickson.

- (3) In addition to Erickson approval, Fatigue Controlled Part sub-tier sources shall be controlled and approved in accordance with the 299-100-840 specification.
 - (4) Sub-tier sources providing non-controlled detail items within a controlled assembly must be approved and controlled by the Erickson quality system requirements.
- b) Approved controlled item sources for Bell Processing Specifications (BPS) requiring Bell facility approvals are identified within the *Approved Processor Listing, QPS 101*. Supplier purchase orders for processing controlled items shall include the following information in addition to standard quality system requirements:
 - (1) Controlled item level, e.g. "Primary", "Critical", "Makes a Critical", "Flight Safety".
 - (2) Serial numbers listed on the shipping documents.
 - (3) If the process operation involves a "Significant" or "Critical" characteristic, the characteristic level is identified on the shipping document.
 - c) Processes controlled by specifications other than a BPS, such as MIL-SPECS or industry processing specifications involving a "Significant" or "Critical" characteristic shall require the source be Erickson approved to the "controlled item" level of hardware or higher. The purchasing documents for this type of processing of controlled items shall also include the additional information noted above.

4. Manufacturing Verification

Operator Buy-Off: Manufacturing shall signify completion of each Critical Characteristic "⬠" operation on the manufacturing operational planning with a buy-off by the operator(s) completing the operation. The buy-off consists of a legible name, employee number (or other suitable operator identification), initials, and date.

5. Inspection, Testing, and Documentation

- a) Measurement Equipment: All measurement and test equipment used to inspect Flight Safety items shall be discriminate to within ten percent (10%) of the total tolerance spread for the feature being inspected. For total tolerance spreads of less than .001 inch, measurement equipment is to discriminate to twenty percent (20%) of the spread. Equipment less discriminate shall only be used with the specific approval of Erickson PRB.
- b) 100% Inspection: Any feature controlled as a Critical Characteristic requires 100% inspection of the feature for each part. Statistical methods in lieu of 100% inspection may be utilized only after receipt of written approval from Erickson.
- c) First Article Inspection: When a FAI for a controlled item at the detail part level is completed, Supplier shall contact Erickson to determine if FAI verification will be performed at source. Supplier must request the inspection a minimum of 14 days in advance of the schedule date the inspection is to be accomplished. AS9102 is required per standard contract quality requirements.
- d) Final Inspection Check Sheet: A final inspection check sheet for each controlled item shall be used by Supplier to verify inspection of production lots to specified requirements and must accompany

manufacturing planning submittal to the PRB for approval/freezing prior to delivery of first production parts.

- e) The inspection check sheet must provide traceability to the production order or traveler, quantity of parts in the manufacturing lot, including a list of all attributes as specified on the engineering documentation including dimensions, notes, material, actual test results, and document inspection results. Recording of actual results is not required for all parts in the lot.
- f) The method of inspection will be shown for each attribute, i.e., type instrument used, visual, or certification review.
- g) The names of sub-tier sources used for NDT and processing such as heat treat, cadmium plate, etc. shall be shown for each process.
- h) Check sheets will have significant "▼" or critical characteristics "◊" annotated or clear identification of characteristic level.
- i) Serial numbers, when applicable, will be noted on check sheets
- j) Hardness Inspection: When heat treating is required by engineering drawing, the applicable controlled item shall receive a hardness test which will be conducted after all processing or exposure to elevated temperature operations. In cases where it is not practical to check hardness after all thermal operations (for example parts that receive plating or coating that preclude accurate hardness tests) may be hardness checked earlier in the manufacturing process, provided that all subsequent thermal operations, such as embrittlement relief baking, are performed in ovens equipped with excess temperature controls such as automatic shutoff devices, audible alarms, or other suitable controls to prevent processing temperature exceedance.

EXEMPTION NOTES:

- (1) Hardness testing when followed by only chemical process tank operations performed above room temperature does not have to be repeated after the processing.
- (2) Titanium, tungsten and non-metallic parts are exempt from this requirement.
- (3) Product having specific engineering requirements as to when hardness testing is to be performed shall be exempt from this requirement.
- (4) When the hardness is designated as a Significant "▼" or Critical Characteristic "◊" inspection records include documentation of actual hardness readings for each part.
- k) Thread Inspection: Threaded features related to controlled items require inspection methodology to assure correct thread form and size.
 - (1) The proper gauging and controls shall be established during first article and continued during production, to assure a uniform thread configuration. The plan shall include:
 - (a) External threads: Dimensionally inspect major diameter (100%);
 - (b) Internal threads: 100% inspect minor diameter;
 - (c) Normal GO/NO-GO gauging and visual inspection. (Gage insertion depth must be sufficient to identify taper and lead error)
 - (2) In addition to the above controls, internal and external threads produced by single point tooling requires:
 - (a) External Threads - A 10% comparator evaluation of thread form;
 - (b) Internal Threads - A 10% thread cast and comparator evaluation of thread form;
 - (c) All thread form inspections are documented, including serial numbers, if applicable.

NOTE: A contour reader or equivalent may be used for the above inspections in lieu of casts.

- (3) Any threaded parts used for setup, trial run, or test must be identified and segregated to prevent mixing with production parts. Once a part has been removed from setup, no additional threading shall be permitted.
- (4) Taps used to produce threads shall be inspected to assure they will produce the specified thread configuration. Gauging of threads produced must be used to confirm continued uniform thread configuration.
- l) Abusive Machining Detection: Nital etch inspection shall be performed on controlled items fabricated from ferrous metals for detection of abusive machining.
 - (1) Nital etch inspection is applicable to all ferrous parts having a hardness of Rockwell C 40 (180,000 psi) or greater but does not apply to nitrided parts or parts manufactured from precipitation-hardened steels.
 - (2) Nital etch inspection will be performed per the requirements of BPS 4092. Acceptance criteria are as specified in BPS 4092, unless the drawing provides unique acceptance criteria.
 - (3) For Erickson designed product, nital etch inspection will be performed and acceptance criteria will be per the requirements defined by Erickson engineering.
 - (4) Site facility approval as required by BPS 4092 will not be required, unless BPS 4092 is invoked by the applicable engineering drawing.
 - (5) When sampling methods are used, a representative sample of parts selected from each production lot; or the entire lot, if less than ten (10) parts, shall be subjected to nital etch inspection after completion of all machining operations. Should abusive machining be detected on the sample size, all parts within the lot are subjected to nital etch. If statistical inspection is utilized, sampling plans shall preclude the acceptance of lots whose samples have known nonconformities. Sampling plans permitting acceptance of defectives are not allowed.
- m) Destructive Testing: Controlled items requiring destructive testing will have the testing performed on a lot or batch basis as defined per engineering requirements or, if not defined by engineering, as defined within approved/frozen planning. No skip lots will be allowed.

6. Material Review of Non-Conforming Parts

- a) Nonconformities must be submitted for Erickson Material Review Board consideration through the Non-Conformance Report (NCR) process. Nonconformities involving controlled items must be identified on rejection documents with the appropriate controlled item level, (e.g. "Primary", "Critical", (including composite item designated as "Makes a Critical"), "Flight Safety", "Fatigue Controlled") in bold letters preceding the description of the nonconformance(s).
- b) Rejection documents for nonconforming "Significant" "▼" or "Critical" "◆" characteristics must identify these characteristics by applicable symbol or clear identification of characteristic level.
- c) Rework planning for nonconforming controlled items requiring deviation from the initially approved planning package, must be submitted for review and approval by the PRB. Rework to the original work plan sequence does not require approval. Rework planning, including special processes, is to be submitted and approved prior to accomplishment of the rework action.
- d) A copy of any rework planning applicable to a nonconformity being submitted through the NCR process must accompany the submittal.
- e) Any rework of a shot-peened surface must be approved by the PRB.
- f) Rework planning related to local, mechanical damage, i.e. nicks, dents and scratches, is not considered as rework that differs from the original planning instructions. However, any NDT and/or all chemical /organic finishes included in the original planning instructions must be included in the rework planning and accomplished locally on the part.
- g) Controlled items returned from customer or from service will be processed in accordance with the engineering requirements and approved procedures as specified in the contract.

7. Shipping Identification

- a) Shipping documents for assemblies containing controlled item detail parts shall include a listing of each controlled detail part number, manufacturing date (if detail is not serialized) and serial number (when applicable).
- b) Shipping Identification: Suppliers will apply unit and container (intermediate and/or shipping) marking as required by applicable contract.
- c) The exterior of containers with controlled items or assemblies made with controlled items shall be identified with part number(s), serial number(s), if applicable, and the designation of the controlled items (i.e. "Primary Part", "Critical Part", "Makes a Critical Part", "Flight Safety Part")

C. Process Source Requirements for Controlled Items

1. Traceability/Serialization

When controlled items being processed are serialized, serial number traceability will be maintained throughout the process and will be recorded on processor's quality documents.

2. Process Planning Review & Approval

Processors of controlled items must provide Erickson with applicable process/NDT planning and technique card/sheet for each part number containing the following as applicable:

- (1) Notation of designation on planning document (i.e., "Primary", "Critical", "Makes a Critical", "Flight Safety").
- (2) Processor's name and physical location.
- (3) Planning revision level and/or date.
- (4) Planning Revision History Record Sheet showing initial release and reason for subsequent revisions.
- (5) Part number, complete with dash number.
- (6) The process specification revision along with any process engineering changes not yet incorporated.
- (7) Processing operations to a Bell or military/non-government specification must show direct reference to the process, technique or set-up card, and annotation of required bake time – temperatures when applicable. As an alternative, the planning may reference a supplier's internal process procedure which reflects the required time and temperature. The internal procedure, becomes a part of the manufacturing planning is considered "FROZEN" upon approval of planning with any changes to the procedure having to be submitted to Erickson prior to incorporation.
- (8) Significant "▼" or critical characteristic "◆" identification at each point the characteristic is noted on the planning.
- (9) Provisions for recording serial numbers when applicable.
- (10) Sketches, diagrams or supplemental instruction sheets used in the manufacture of the part.

3. Purchasing

Any subcontracting by a processor for a controlled item must be subcontracted to a source that is Erickson approved for controlled items. The list of approved suppliers is maintained on the Erickson B2B portal.

NOTE: Suppliers appearing in Bell QPS-101 may be used but must be approved as controlled item suppliers per §A.2.a)(1).

4. Processor Verification

Operator Buy-Off: Processor shall signify completion of each Critical Characteristic "⬠" operation on Operational Planning with a buy-off by the processor personnel completing the operation. The buy-off consists of a legible name, employee number (or other suitable operator identification), initials, and date.

5. Inspection

Any feature controlled as a Critical Characteristic requires 100% inspection and documentation of the feature for each part. Statistical methods in lieu of 100% inspection may be utilized only after receipt of written approval by Erickson.

6. Material Review of Nonconforming Parts

- a) Nonconforming material must be segregated, documented and communicated to the Supplier who Erickson has contracted to provide the controlled item.
- b) Rework planning required due to deviation from the initially approved planning shall be developed and submitted to Erickson for PRB approval, reference rework planning requirements noted above.