FIRST ARTICLE REQUIREMENTS

(AFMCI 64-110, AFMCI 23-102 and FAR Part 9, Sub Part 9.3) (Additional Instructions on Page 3)

1. DATE: 7 Oct 02

2. P.R./MIPR NUMBER:

3. PART NUMBER: 4053280

4. NSN: 2840 01 235 9294

5. FIRST ARTICLE QUANTITY

THE FIRST ARTICLE IS 10 UNIT(S) OF LOT/ITEM _____

AND WILL BE [ ] PART OF PRODUCTION QUANTITY [X] IN ADDITION TO PRODUCTION QUANTITY

6. ARTICLES

[ ] WILL [X] WILL NOT SERVE AS A MANUFACTURING STANDARD

7. LONG LEAD TIME ITEMS

[ ] REQUIRED [ ] NOT REQUIRED

(See FAR 52.209-3 or -4, alternate II)

8. SPECIAL REQUIREMENT/PRODUCTION FACILITIES *(See FAR 52.209-3 or -4 Alternate I)*

[X] REQUIRED [ ] NOT REQUIRED

"The First Article offered must be manufactured at the facilities in which that item is to be produced under the contract, or if the First Article is a component not manufactured by the contractor, such component must be manufactured at the facilities in which the component is to be produced for the contract. A certification to this effect must accompany each First Article which is offered."

9. TEST/INSPECTION REQUIREMENTS

A. [ ] CONTRACTOR TESTING [X] GOVERNMENT TESTING

Performance or other characteristics which the First Articles must meet are Conformance to P&W drawing 4053280 and its associated subtier drawings and specifications

B. The detailed technical requirements for First Article approval tests are contained in See block 12

(Cite Spec and Para number)

C. [X] TEST PLAN REQUIRED

(1) DD Form 1423 ELIN A001

(2) Delivery due 30 calendar days from date of contract.

(3) Number of days for government approval/disapproval 45 days.

D. Contractor's notification to ACO and OC-ALC/LPFRA *(Requesting Activity)* of test time and location due 30 days prior to start of testing.

E. [X] TEST REPORT REQUIRED

(1) DD Form 1423 ELIN A002

(2) Due 120 calendar days from date of contract.

(3) Forwarded to OC-ALC/ENRS, 3001 Staff Dr, STE T-69 Tinker AFB, 73145-3036, ATTN: F. A. Monitor

(4) Government written notice of approval/disapproval due 60 days after receipt of contractor's report.

F. FIRST ARTICLE DELIVERY:

(1) Due within 120 calendar days from date contract.

(2) Notify 30 calendar days prior to shipment.

(3) Delivered to government at SEE BLOCK 12

(Set Forth Consignee and Address)

(4) Government written notice of approval/disapproval within _____ days after receipt of first article package.

G. Estimated cost of government testing/inspection evaluation.

$

10. DISPOSITION OF FIRST ARTICLES

[X] Approved First Articles will be forwarded to USAF Supply

[X] 3 *(insert quantity)*, first articles will be expended intesting. Residual components of disapproved first articles [ ] will be returned to the contractor/ [X] will be retained by the contractor pending disposition instructions from the contractor.

[ ] First articles will be installed on aircraft/equipment to determine proper fit/function. Approved article will remain on the aircraft/equipment and will not be forwarded to USAF Supply, but will be considered part of the contract quantity.

[ ] Disapproved first articles will be returned to the contractor/ [ ] will be retained by _____ pending disposition instructions from the contractor

[ ] On purchase requests designated as direct shipments the following disposition will apply. (NOTE: Always applicable on Foreign Military Sales (FMS))

a. Approved first articles will be returned to the contractor for shipment with production item

b. Disposition of disapproved first articles will remain the same as marked above

[ ] Other Disposition: _____

ENRS/M. Farley/06 NOV 02

AFMC FORM 260, MAY 97 *(EF-V1) (PerForm Pro)* PREVIOUS EDITION IS OBSOLETE

11. CONDITION(S) FOR WAIVER OF FIRST ARTICLE APPROVAL

a. [X] Offerors who have previously furnished production quantities of the same or similar article to the prime contractor for delivery to the ____ Government, ____ DoD, X Air Force.

b. [ ] Offerors currently in production of the same or similar article for a ____ Government, ____ DoD, ____ Air Forcecontract and who have received First Article approval under the existing contract

c. [X] Offerors who have previously furnished production quantities of the same or similar articles for a ____ Government, ____ DoD, X Air Force provided articles thus furnished have exhibited satisfactory performance in service, in the opinion of the Air Force.

d. [X] Provided not more than 36 months have elapsed since completion of the contract.

e. [ ] First Article testing will not be waived.

f. [X] See Remarks in block 12 below.

NOTE TO BUYER: UNDER CONDITIONS A AND C ABOVE, THE COGNIZANT ENGINEERING ACTIVITY WILL DECIDE WHETHER OR NOT THE ITEM HAS EXHIBITED SATISFACTORY PERFORMANCE IN SERVICE AND PREPARE AND RETAIN SUPPORTING DOCUMENTATION TO FULLY JUSTIFY THIS DECISION. THE BUYER MUST SOLICIT DUAL PRICES *(That is, both with and without requirement for first article approval)* AND MUST FURNISH THE COGNIZANT ENGINEERING ACTIVITY WITH THE FOLLOWING INFORMATION ON THE PREVIOUSLY SUPPLIED ARTICLE:

A. PROCURING OFFICE	B. CONTRACT NUMBER	C. DATE OF CONTRACT	D. SPECIFICATION NUMBER AND REVISION

12. REMARKS

9. F.(3) Deliver Government First Articles to:
DDOO-SOP (First Articles)
Bldg 18, Door 16 (405) 739-7667
8080 Perimeter Rd
Tinker AFB, OK 73145-8000
DODAAC: FY2303
MARK FOR: First Articles
ATTN: DDOO-SOP
DO NOT POST, NON-ACCOUNTABLE
DO NOT PUT INTO SUPPLY

12.1 First Article testing shall consist of but not be limited to the following:
12.1.1 Verify that the material of individual components conforms to the material specifications called out on the drawings
12.1.2 Verify that all dimensions conform to the component and assembly drawings. Individual components shall be evaluated prior to assembly.
12.1.3 Verify material hardness when called out on the drawing.
12.1.4 Verify compliance to any finish requirements.

12.2 Additional condition for first article waiver.
12.2.1 If the contractor is the prime, Pratt and Whitey.

12.3 Approved first article will be retained at the contractor's plant for reconditioning, if necessary, with final aceptance being the same as for production items. If a first article is expended in testing, then approval of the first article will constitute acceptance. Approved first articles shall not be used as a prototype or manufacturing standard.

12.4 These requirements have been developed by OC-ALC/LPFRA and shall not be modified.
Justification

PN 4031508, Assembly of No 1 bearing seal ring holder. This part is a critical part that requires LPFR engineering control to the extent of requiring a first article. LPFRA requires absolute assurance that this part be made precisely to technical requirements which can be accomplished via a first article. Because of its location, failure of this part can be disastrous to the aircraft.

13. COGNIZANT ENG ORGANIZATION RESPONSIBLE FOR CONDUCTING AND/OR APPROVING TEST *(Name, Organization, Phone)*	14. PR INITIATOR *(Name, Organization, Phone)*
Julian Garcia, OC-ALC/LPFRA, DSN 884 8692	

CONTRACT DATA REQUIREMENTS LIST

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 440 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. Please DO NOT RETURN your form to either of these addresses. Send completed form to the Government Issuing Contracting Officer for the Comtract/PR No. listed in Block E.

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY: TDP TM OTHER
D. SYSTEM/ITEM 4053280	E. CONTRACT/PR NO.	F. CONTRACTOR

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
A001	FIRST ARTICLE TEST PLAN	2840 01 235 9294

4. AUTHORITY (Data Acquisition Document No.)	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
DI-NDTI-80809		OC-ALC/LPFR

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
Yes	a	ONCE	SEE BLOCK 16
8. APP CODE		11. AS OF DATE	13. DATE OF SUBSEQUENT
		SEE BLOCK 16	

17. PRICE GROUP

18. ESTIMATED TOTAL PRICE

16. REMARKS

Contractor shall provide a plan that ensures all drawing requirements are met on each first article. The plan shall include the equipment and facilities used to verify all drawing requirements. As a minimum, the plan shall address the following requirements:

a. A list of all drawing dimensions, surface textures, etc., to be inspected and the equipment to be used to verify each dimension, surface texture, etc. An actual drawing shall be submitted that correlates the dimensions on the drawing to those identified on the list.

b. A plan to verify that all non-destructive inspections are met.

c. A plan to verify that all visual insepctions requirements are met.

d. A plan to verify all material property requirements are met including, but not limited to, mechanical properties, metallurgical properties, chemical compositions, etc.

e. A plan to ensure that manufacturing processes are performed by OEM (Pratt and Whitney) certified vendors.

f. A plan to ensure that the forging/casting source(s) are OEM approved for the specific forging/casting, if applicable.

Additional guidelines for first article test plans are contained in LPF-QAR-003.

The test plan must be approved by OC-ALC/LPFR prior to delivery of test report as required by the contract.

The test plan shall be received by OC-ALC/ENRS no later than 30 calendar days after contract award date.

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES Draft	Final Reg	Final Repro
OC-ALC/ENRS		2	
3001 STAFF DR			
STE T69			
TINKER AFB,			
OK 73145-3036			
ATTN:			
FIRST ARTICLE			
MONITOR			
DSCR-JLP			1
Richmond			
VA 23297			
-5877			
15. TOTAL →		2	1

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE
JULIAN GARCIA	7 Oct 02		8 Oct 02

DD Form 1423-1JUN 90 (EF) PREVIOUS EDITIONS ARE OBSOLETE. Page ____ of ____ Pages

CONTRACT DATA REQUIREMENTS LIST

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 440 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. Please DO NOT RETURN your form to either of these addresses. Send completed form to the Government Issuing Contracting Officer for the Comtract/PR No. listed in Block E.

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY: TDP TM OTHER
D. SYSTEM/ITEM 4053280	E. CONTRACT/PR NO.	F. CONTRACTOR

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
A002	FIRST ARTICLE TEST REPORT	2840 01 235 9294

4. AUTHORITY (Data Acquisition Document No.)	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
DI-NDTI-80809		OC/ALC-LPFR

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
YES	A	ONCE	SEE BLOCK 16
8. APP CODE		11. AS OF DATE	13. DATE OF SUBSEQUENT
		SEE BLOCK 16	

17. PRICE GROUP
18. ESTIMATED TOTAL PRICE

16. REMARKS

The first article test report shall satisfy all requirements in the first article test plan. All drawing requirements must be satisfied including dimensions, visual inspections, non-destructive inspections, manufacturing processes and material requirements. The test report shall identify the subvendors utilized to perform manufacturing and inspection processes and proof that these subvendors are OEM (Pratt and Whitney) certified to perform the process(es). A copy of the process sheets used to maufacture the first articles shall be included in the report.

Additional requirements for the test report are contained in LPF-QAR-003.

The first article test report shall be received at OC-ALC/ENRS no later than ~~20~~ 45 calendar days after test plan approval by OC-ALC/LPFR.

4b
OC-ALC/LPFRA
y OCTOC

14. DISTRIBUTION a. ADDRESSEE	b. COPIES Draft	Final Reg	Final Repro
OC-ALC/ENRS		2	
3001 STAFF DR			
STE 109			
TINKER AFB			
OK 73145-3036			
ATT:			
FIRST ARTICLE			
MONITOR			
DSCR-JLP			
Richmond			
VA 23297			1
-5877			
15. TOTAL		2	1

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE
Julian Garcia	7 Oct 02		8 Oct 02

DD Form 1423-1, JUN 90 (EF) PREVIOUS EDITIONS ARE OBSOLETE. Page ____ of ____ Pages

1. This document provides guidelines for the preparation of first article test plans/test reports for F100 engine parts where referenced within the first article data of a contract.

2. FIRST ARTICLE QUANTITY. The quantity of first articles shall be per the contract. The quantity of articles allowed for destructive testing, in accordance with the contract, shall be tested per the first article procedure in its entirety, to include the destructive testing. The remaining articles shall only be tested per the nondestructive portions of the procedure.

3. TESTING REQUIREMENTS.

3.1. Testing shall consist of, but shall not be limited to, the verification of the following.

3.1.1. Dimensional conformance including finish requirements.

3.1.2. Conformance to non-destructive inspection requirements (FPI, Ultra-sonic, Eddy Current, X-ray, visual)

3.1.3. Conformance of material properties to include mechanical, metallurgical and chemical.

3.1.4. Conformance to other required processes, specifications, and standards listed on the drawing including sub-tier specifications and standards, special requirements as described in the engineering instructions (EI), quality plans, etc.

3.2. First articles shall be serialized. Serial Numbers are to be identified prior to commencement of testing unless otherwise specified.

3.3. Dimensional Inspection.

3.3.1. All dimensions, as listed on the assembly drawing and detail drawings, to include drawing notes, shall be measured where possible on all first articles 100% (no sampling allowed).

3.3.2. A tabular format shall be used with drawing dimension, tolerance, measurement, and instrument/gage/tooling/serial number used.

3.3.3. All tooling and gaging used for inspection and acceptance/rejection of first articles shall have calibrations from a laboratory traceable to NIST and in accordance with ISO 10012-1 (formerly MIL-STD-45662), listed in a (tooling & gaging table) table, table shall include nomenclature, serial number, calibration frequency, next calibration date, range, least increment, and accuracy. Listing shall also include alignment tools and constraint fixtures.

3.3.4. Inspection results shall be presented in a table showing the feature measured, dimension and tolerance, actual reading and gage serial number used.

3.4. Nondestructive Inspections (NDI), including Fluorescent Penetrant Inspections (FPI), Ultrasonic Testing (UT), Eddy Current (EC), Radiographic Testing (x-ray), and visual inspections, shall meet the following:

3.4.1. All first articles shall receive 100% of the inspections identified on the QAD. Sampling shall not be allowed.

3.4.2. NDI shall be per the applicable specification(s).

3.4.3. Sources used shall be Pratt&Whitney approved per the OC-ALC/LPFR letter granting source approval to the contractor.

3.4.4. NDI results shall be presented in a table showing the feature inspected, acceptance/rejection criteria used, results and gage/master serial number used. In cases where photographic standards within a VIS specification are applied to an NDI, the inspection report shall include a copy.

3.4.5. Inspection Masters/Transfer Masters shall have current calibrations. A copy of the calibration(s) shall be included into the report.

3.4.6. Level III or Level II inspectors, as applicable, shall be required. A copy of the inspector's certification(s) shall be included into the report.

3.5. Visual Inspections shall include:

3.5.1. Specific visual inspections per a Pratt&Whitney Visual Inspection Standard (VIS) document shall be called out of the applicable VIS and cited as specific inspections.

3.5.2. Visual inspection results shall be presented in a table showing the feature inspected, acceptance/rejection criteria used, results, and gage/master serial number used (as applicable).

3.5.3. In cases where photographic standards within the VIS are used, the inspection report shall include a copy.

3.6. Material properties testing shall include mechanical properties, metallurgical properties, and chemical composition tests, as applicable, per the material specifications and the following:

3.6.1. Composition, heat treat condition, and other characteristics/properties, as listed in the technical requirements section, acceptance section, and/or quality sections of the specification(s) so as to verify that the materials and processes are sound, clean, and free of imperfections detrimental to the performance of the part or assemblies.

3.6.2. In some cases a material suppliers certification will not be sufficient and the Contractor shall have redundant testing performed.

3.6.3. Metallurgical microanalysis, as applicable, for raw materials, weldments, brazements, and coatings shall be conducted. Results shall include the complete laboratory report including photomicrographs.

3.6.4. Mechanical testing, as applicable, per manufacturing specifications and the drawing(s).

3.6.5. In cases where the applicable specifications require test reports, these shall accompany the First Article Test Report (FATR).

4. SUBMITTAL.

4.1. The First Article Test Plan (FATP) shall be delivered to the Contracting Officer in accordance with the schedule as listed in the contract, or Form DD1423. The FATP shall provide a detailed description of specific testing instructions to be used. Generalized instructions will not be acceptable.

4.2. The First Article Test Report (FATR) shall be delivered to the Contracting Officer in accordance with the schedule as listed in the contract, or Form DD1423. All laboratory test results, including those resultant from testing conducted at the contractor's facility and including sub-vendor testing, shall be provided with the FATR in their complete form as provided by the testing laboratory(ies).

5. DISPOSITION OF PARTS.

5.1. When required by the contract, the remnants from destructive testing shall be delivered with the First Article Test Report.

5.2. When required by the contract and following the completion of non-destructive testing, one article shall be delivered to the Contracting Officer and packaged in accordance with contract requirements. Marking on the package shall be **UNSERVICEABLE - Condition Code "R"**. Deliver this part with the First Article Test Report. The other(s) shall be handled in accordance with the contract.

6. GENERAL REQUIREMENTS.

6.1. All First Articles and all Production Articles shall be fabricated from material whose metallurgical state is in compliance with the drawing requirements, as well as all sub-tier specifications and standards referenced therein.

6.2. All First Articles and all Production Articles shall be new manufactured under this contract. No items manufactured under previous contracts shall be delivered without approval.

6.3. The subcontractors previously identified by the contractor as sources to be employed, to include laboratory testing, shall be the only sources used. If the contractor wishes to employ a subcontractor other than previously identified, they shall substantiate that the new source is OEM approved for the specific testing required. A change in the address of a source shall be construed as a change of source. Employment of alternate sources shall only be authorized byOC-ALC/LPFR.

6.4. Engineering Instructions shall take precedence over all other technical instructions.

---------- **END OF DOCUMENT** ----------

26 Jan 01

Rev. B

QUALIFICATION REQUIREMENTS FOR MANUFACTURING

1. APPLICATION.

1.1 This Qualification Requirements applies to all F100-PW-100/200/220/220E engine compressor inlet variable vane (CIVV) arm assemblies identified in Appendix A.

2. PURPOSE.

2.1 This document establishes the minimum technical requirements which prospective sources must satisfy in order to obtain engineering source approval for the specified applications. Conditions of waiver for these criteria are identified in LPF-QR-002.

2.2 Approval is part specific and the documentation required by sections 4.1 and LPF-QR-001 shall be provided for each item for which approval is sought. The remaining documentation may be submitted in a single package provided it is referenced in each source approval request and no unique circumstances or procedures apply to any of the components for which approval is sought. All documentation provided as evidence of compliance with requirements specified herein must be in English.

2.3 Engineering source approval shall be valid for two years from the date of the OC-ALC letter notifying the contractor of engineering source approval. Approved sources which have not delivered or been contracted by OC-ALC to deliver the approval item during this period shall be required to resubstantiate their capability. Resubstantiation shall involve documenting that no significant changes to process location sequence, or parameters have occurred and no significant quality deficiencies are awaiting corrective action. Significant changes or unresolved quality deficiencies may result in additional testing or revocation of source approval status depending on the nature and extent of the changes and/or quality deficiencies.

2.4 Prospective sources are advised that these components are fracture critical parts.

3. REFERENCE DOCUMENTS.

3.1 LPF-QR-001: BASIC TECHNICAL DATA PACKAGE REQUIREMENTS FOR FCP/DCP Definitions of terms used are specified in this document.

3.2 LPF-QR-002: CONDITIONS OF WAIVER FOR FRACTURE CRITICAL/DURABILITY CRITICAL PARTS

3.3 LPF-QAR-001: GENERAL QUALITY ASSURANCE REQUIREMENTS FOR F100 ENGINE FCP/DCP BREAKOUT COMPONENTS

ATTACH 2

4. CONTRACTOR RESPONSIBILITY STANDARDS: (FAR 9-104)

4.1 General standards as specified in FAR 9-104.1 apply.

4.2 Special standards as specified in FAR 9-104.2 apply.

4.2.1 The specific special standards to be applied are determined by the conditions which form the basis of the source approval request submitted by the Offeror. There are only two conditions which will satisfy the technical requirements for this component. Prospective offerors must be Category I or Category II as defined in the definitions listed in LPF-QR-001.

5. PROOF OF CAPABILITY. (FAR 9.105-1, FAR 9.200, & AFLCR 800-10)

5.1 Offerors shall provide proof of satisfactory manufacture of production quantities of the approval item or a similar component within the last two years for an OEM, which has designed and developed similar engines, or compressor sections of similar engines, and provided them to a US DoD activity or defense agency of a NATO country.

5.1.1 The "similar" component must be an arm, lever, or linkage which satisfies the following criteria for similarity:

5.1.1.1 Component of a critical control system, which is subject to cyclic loading and used in a proven fighter aircraft turbofan or turbojet engine.

5.1.1.2 A formed thin-walled sheet metal component of high temperature nickel alloy equivalent in formability and complexity.

5.1.1.3 Demonstrates ability of the Offeror in conjunction with subvendors to machine requisite slots and holes of equivalent complexity and tolerances in thin-walled material of equivalent machinability perform all requisite significant manufacturing processes.

5.1.2 Multiple components may be used to demonstrate compliance with 5.1.1. However, all components must be of a high-temperature nickel alloy and comply with the requirements of 5.1.1.1.

5.2 The Offeror shall substantiate proof of capability with documentation which is tailored to the requirements of 5.1 and which satisfies the basic technical data package requirements specified in LPF-QR-001.

5.3 Identify all sources of sheet stock, forming operations, heat treat, specific conventional machining operations, non-conventional machining (if applicable), and fluorescent penetrant inspection to be employed in the production of the approval item for OC-ALC including the specific operations to be performed by each source, and the address of the plant where operations

are to be performed. Processes to be performed or produced in-house by the Offeror shall be identified as such. This requirement also applies to Category I Offerors as well. All sources are subject to approval by the cognizant OC-ALC Fighter Propulsion System Division Engineering Section. Evidence that a proposed subvendor is a P&W LCS Supplier is not in itself sufficient to justify approval. Approval shall be restricted to the following conditions:

5.3.1 The Offeror shall substantiate that sources of raw material to be employed for sheet stock are currently OEM-approved mill sources for nickel alloys produced by multiple melting using consumable electrode practice or produced by vacuum induction melting.

5.3.2 The Offeror shall substantiate that source(s) to be employed for solution heat treatment of the sheet material and plate, including themselves, are approved by P&W to heat treat per PWA 11-31 or PWA 11-32.

5.3.3 The Offeror shall substantiate that source(s) to be employed for precipitation heat treatment of the finished component, including themselves, are approved by P&W to heat treat per PWA 11-17 and PWA 11-32 or perform an equivalent heat treat for another OEM, and are in possession of P&W MCL Manual Sections E-189 and are authorized by P&W to utilize this data in fulfilling the production requirements of US Government contracts with sources other than P&W. As an alternative the Offeror may substantiate that they are in possession of equivalent microstructure standards for intergranular/intragranular oxidation and attack and alloy depletion of nickel base superalloys.

5.3.4 The Offeror shall substantiate that the source(s) to be employed for electro-discharge machining (if used), including themselves, are approved by P&W to perform PWA 97-2 or another OEM to perform an equivalent process. In addition, the Offeror shall substantiate that the source has performed the process satisfactorily on production quantities of a similar component in accordance with 5.1 of this document. For this process structural components other than those referenced in 5.1 may be considered. The Offeror shall also substantiate that the source is in possession of P&W MCL Manual Section E-54 or equivalent microstructure and are authorized by P&W to utilize this data in fulfilling the production requirements of US Government contracts with sources other than P&W. As an alternative the Offeror may substantiate that they are in possession of equivalent microstructure standards.

5.3.5 The Offeror shall substantiate that source(s) to be employed for fluorescent penetrant inspection (FPI), including themselves, are approved by P&W to perform FPI per FPM Code 6 or perform an equivalent FPI process for another OEM. The Offeror shall also substantiate that the source(s) is in possession of TAM 146040-C.

5.3.6 In all instances where substantiation of OEM approval is required the Offeror shall include a copy of the official OEM process certification and all conditions and restrictions imposed by the OEM. In all cases where process approval is relative to an OEM process specification other than the requisite P&W process specification, the complete specification must be provided and the equivalence of the specifications must be clearly demonstrated by the

Offeror in order to obtain the approval of the cognizant OC-ALC Fighter Propulsion System Engineering Section, LPFR.

5.4 The Offeror shall provide evidence that the quality assurance system and available expertise which currently exists within the Supplier's facility, is capable of establishing and maintaining effective process control, and otherwise ensuring the ongoing quality of all material and significant processes performed in-house or by subvendors. The documentation provided may pertain to components made for the DOD as well as an OEM and shall include the following:

5.4.1 A copy of latest document(s) which describe and govern the quality assurance system in effect at the Offeror's facility(ies).

5.4.2 Substantiation that Offeror quality procedures satisfy the requirements of LPF-QAR-001.

5.4.3 Specific procedures/specifications governing the control of sheet stock, heat treat (including control of furnaces employed in these processes), nonconventional machining (if applicable), and fluorescent penetrant inspection, for use in the fabrication of the approval item. The procedures shall also address the certification of NDT inspectors.

5.4.4 Samples of contractual requirements previously imposed on sources of sheet stock,, heat treatment, non-conventional machining (if applicable), fluorescent particle inspection, and laboratory testing (when independent laboratory is used for production acceptance testing and/or overtesting).

5.4.5 Sample reports documenting the results of system, process, and product audits previously conducted by the Offeror in-house and at subvendor's facilities. Audits shall include heat treat, non-conventional machining (if applicable), fluorescent penetrant inspection, magnetic particle, and etch inspection processes. The Offeror shall also identify the frequency of the audits and provide the specific procedures, guidelines, or checklists used. All documentation provided shall pertain to structural components.

5.4.6 Sample test reports reflecting overtesting/ overinspection conducted by or under the direction of the Offeror for verifying that certificates of test or conformance provided by subvendors are complete and supported by process data and numerical test results from an OEM-approved laboratory for the requisite testing, are representative of material received, and that the material is in conformance with Purchaser requirements. Sample test reports shall be provided for sheet stock, heat treatment, and non-conventional machining (if applicable). In the event these processes are performed in-house the test plan shall define in-process testing and overtesting performed as quality assurance measures. In the event overtesting is subcontracted the Offeror shall provide a sample of a statement of work/instructions previously used to obtain the testing from an independent laboratory.

5.5 The Offeror shall submit a Quality Plan specifically tailored to the approval items which as a minimum defines the following:

5.5.1 Specific purchase order requirements to be imposed on subvendors of sheet stock to assure that certificates of test/conformance provided with shipments from subvendors include complete test data and testing source(s) are approved labs.

5.5.2 Specific purchase order requirements to be imposed on subvendors of heat treat, and non-conventional machining (if applicable), and fluorscent pentrant inspectionsignificant metal removal processes to assure that manufacturing processes have been approved by the proper authority and significant changes are not made without proper authorization and that the proper acceptance/rejection criteria is used.

5.5.3 Test plan for specific overtesting/overinspection to be conducted by or under the direction of the Offeror on sheet stock and semi-finished material from subvendors of significant processes including forming operations, heat treat, and significant metal removal processes to include: frequency of overtesting, identification of test specimen (actual production article, integral test piece, or separate representative test piece), position of test specimens within the production article, orientation of test specimens, description of test specimens (configuration and dimensions), heat treat condition, the specific testing to be conducted on each specimen, acceptance/rejection criteria, and identity of the laboratory(ies) to conduct the testing. The Offeror shall substantiate that the laboratory is a P&W-approved laboratory for the specific testing required and has access to all applicable MCL standards or alternate acceptance/rejection criteria.

5.5.4 Identification of the specific procedures, guidelines and checklists for conducting on-site process audits of sources of forming operations and heat treat (including furnace control) and significant metal removal processes and the frequency at which they will be conducted.

5.5.5 Identification of the specific procedures, guidelines and checklists for conducting on-site product and system audits of sources of sheet stock, forming operations, heat treat, nonconventional machining operations, FPI, and laboratory testing.

5.5.6 The specific procedures identified shall also be provided with the Quality Plan unless previously provided. In the event that they have been previously provided the supplier shall so indicate.

5.5.7 Description of the specific background and experience of personnel conducting audits relative to the processes and products to be reviewed.

5.5.8 Provide specific plan for assuring the traceability of the finished component to the the heat treat batch.

APPENDIX A

1. The following components are the subject of qualification requirements dated 26 Jan 01 for F100-PW-220 engine compressor inlet variable vane (CIVV) arms:

Nomenclature	P/N	NSN
Arm, Front Compressor Variable Vane	4053280	2840-01-235-9294PT
Arm, Front Compressor Variable Vane	4039147	2840-00-347-9699PT

JUSTIFICATION FOR PRE-AWARD QUALIFICATION REQUIREMENTS

1. APPLICATION

1.1 This Justification applies to qualification for manufacture of all all F100-PW-100/200/220/220E engine compressor inlet variable vane (CIVV) arms identified in Appendix A.

1.2 Component Description: A formed and machined arm .150 inch thick by approximately 2 inch made from AMS 5596 Nickel alloy.

1.3 Component Function: These arms serve as a link between the Inlet Fan Synchronizing Ring and Variable Vanes.

2. JUSTIFICATION FOR QUALIFICATION REQUIREMENTS

2.1 Criticality: These components have been classified as fracture critical parts by OC-ALC/LPFR, the USAF design control activity. A fracture critical part (FCP) is defined as a highly stressed part which cannot be completely inspected nondestructively; failure of which will result in loss of aircraft due to non-containment or power loss preventing sustained flight, as a direct result of part failure or subsequent progressive failures.

2.2 Complexity: These items are made from AMS 5596 nickel alloy and require precision machining, heat treating, and fluorescent penetrant inspection. The manufacturing process complexities are described as follows:

2.2.1 Many of the alterations produced cannot be detected by nondestructive testing and establishment/verification of fatigue properties requires specialized testing which cannot be accomplished as a matter of routine such as in production acceptance testing. Consequently, part reliability is dependent upon establishing and maintaining effective process control.

2.2.2 Effective process control is achieved by maintaining strict adherence to process parameter values and shop practices which optimize material structure and mechanical properties. Effectiveness is a function of quality of equipment and tooling, shop practices with respect to maintaining coolant, equipment, and tooling; manufacturing techniques, knowledge of process-material interrelationships, and the quality assurance surveillance imposed. OC-ALC lacks the expertise and the resources to assess these aspects in a pre-award survey and the transient nature of these aspects makes it virtually impossible to assess with production sampling alone. Such testing is typically unsystematic due to time constraints. Also each process-material combination is unique and can have variable effects on the structure and properties of material; even those within the same family, i.e.,

Cobalt Alloys. Available guidelines are general and serve only as starting points for FCP which require more in-depth evaluations for part-specific guidelines.

2.2.3 The interrelationships between process parameters, material structure, and mechanical properties is very complex. The complexity is compounded by the fact that characteristics vital to component performance and reliability cannot be completely defined in a manner suitable for inspection purposes. Systematic mechanical and metallurgical test programs, augmented by extensive process-material database compiled from such programs is required to verify the establishment of effective process control. Most manufacturers do not have access to such programs and do not realize the extent to which material structures can be altered and how seriously they can degrade the mechanical properties, life and reliability of a component. OC-ALC does not possess such a database nor does it possess the funding, resources, or expertise to conduct the testing required to verify the effectiveness of established process controls.

2.3 Therefore, procurement must be limited to sources which have demonstrated, to the satisfaction of OC-ALC Engineering:

2.3.1 Knowledge of the interrelationship between parameters of requisite manufacturing processes, material structure, and mechanical properties of the specific alloy in question and is in accordance with the qualification requirements and

2.3.2 The ability to consistently produce the characteristics required to satisfy the service requirement of the F100 Engine.

3. JUSTIFICATION FOR PRE-AWARD QUALIFICATION.

3.1 The probability of a source, that has not been pre-approved by OC-ALC/LPFR, failing to establish and maintain effective process control is high. Failure to establish and maintain effective process control could result in the introduction of components in service which contain deficiencies detrimental to component reliability which would not be detected by nondestructive inspections. Ultimately, this could result in a significant maintenance burden, which in turn would jeopardize USAF ability to fulfill their key role in national defense and national security. Therefore, the technical risks must be minimized.

3.2 Failure to minimize technical risks would enhance the probability of contract award to a first time producer which would underestimate the level of difficulty and the learning curve associated with manufacture of the approval item, as a direct result of contract award to an unqualified source. This could result in substantial delays in delivery and/or contract default. The acquisition lead time for these components varies from 12-24 months and it would be difficult to recover logistically. Failure to deliver serviceable items in a timely manner could result in a work stoppage in the production overhaul line, adversely affecting weapons system supportability and combat readiness. Therefore, the risk of contract default must be minimized through the minimization of technical risks.

3.3 Failure to minimize technical risks would result in a dramatic increase in engine life cycle costs due to an increase in emergency requirements resulting from contractor defaults and slippage's in delivery schedules, engineering and laboratory support required to evaluate non-conforming parts and suspected causes, increased field and depot maintenance costs resulting from more frequent removals and unscheduled removals and increased replenishment spares requirements. Therefore, the financial risks must therefore be minimized through the minimization of technical risks.

4. QUALIFICATION COST.

4.1 There are no costs for qualification testing and testing evaluation incurred by the potential offeror under the requirements for Category 1 or 2 offers as specified in LPF-QR-001. However, there are costs associated with the offeror's development of the Source Approval Requests (SAR) package that is submitted for Government review, and this cost may be as much as $2500.00.

4.2 In addition, the estimated cost for the Government evaluation of a SAR submitted under the requirements for Category 1 or 2 offers which may be incurred by potential offerors is $1,200. This cost may be assumed by the Government if it is in the best interest of the Government to qualify alternate sources.

BASIC TECHNICAL DATA PACKAGE REQUIREMENTS FOR FRACTURE CRITICAL/DURABILITY CRITICAL PARTS

1. APPLICATION.

This specification applies to all F100 engine Fracture Critical Parts (FCP) and Durability Critical Parts (DCP).

2. PURPOSE.

2.1. This document is a supplement to established Qualification Requirements (QR) tailored to a specific part(s) for the purpose of defining the basic documentation required of prospective sources to substantiate proof of capability. It is not all inclusive and prospective sources shall note that satisfaction of all requirements defined by the specific QR applicable to the approval part is required to obtain engineering source approval. The basic documentation submitted by prospective sources shall be tailored to the requirements of the specific QR applicable to the approval part which defines specific criteria for proof of capability. All documentation provided as evidence of compliance with requirements specified herein shall be in English and in the Inch-Pound system.

2.2. QR's applicable to a specific part shall be made available to prospective sources upon request to OC-ALC/BC.

2.3. Prospective sources are advised that source approval consideration on most Fracture Critical Parts (FCP) is restricted to actual manufacturers of the approval part due to limitations in existing government expertise. Consequently, prospective sources are advised to verify as to whether or not the part(s) in which they are interested fall in this category prior to seeking source approval. Information in this regard may be obtained through SA-ALC/BC.

3. DEFINITIONS.

The following definitions shall apply as used in the context of QR's for Fracture Critical Parts and Durability Critical Parts unless otherwise stated in the specific QR.

3.1. **Approval Part/Item -** Part/Item for which source approval is sought.

3.2. **Category 1 Offeror -** A manufacturing/repair source, which in conjunction with their sub-vendors has performed all requisite processes on the approval part for Pratt&Whitney. Offerors in this category must provide documentation relevant to the approval part which satisfies all criteria specified under Proof of Capability in their respective QR's with the exception of those identified in 5.1.1, 5.1.2, and 5.2. In all cases the burden of proof shall reside with the Offeror.

3.3. **Category 2 Offeror -** Manufacturing/Repair source, which in conjunction with their sub-vendors, has performed all requisite processes on a similar part for an OEM. Offerors in this category must provide documentation relevant to a similar part(s) which satisfies all criteria specified under Proof of Capability. In all cases, the burden of proof lies with the Offeror.

3.4. **Critical Characteristic -** A part feature which, if non-conforming would result in probable loss of aircraft due to direct part failure or by causing other progressive part failures.

3.5. **Durability Critical Part -** A highly stressed part which cannot be completely inspected nondestructively; failure of which will result in a significant maintenance burden.

3.6. **Fabricate -** The manufacturing steps necessary for the making of new parts.

3.7. **Fracture Critical Part -** A highly stressed part which cannot be completely inspected nondestructively; failure of which will result in loss of aircraft due to non-containment or power loss preventing sustained flight, as a direct result of part failure or subsequent progressive failures.

3.8. **Inspection Method Sheets (IMS) -** document used to describe the steps involved in executing an inspection or series of inspections to include tooling, gages, fixtures, dimensions and other parameters necessary to execute the required inspections(s).

3.9. **Major Characteristic -** A part feature which, if non-conforming, could compromise the function of the part, resulting in a significant maintenance burden and/or reduction in weapon system performance.

3.10. **Manufacturing Process Sheets (MPS) -** document used to describe the steps involved in executing an operation or series of operations to include tooling, machinery, dimensions, speeds, feed rates, coolants, cutters, tape numbers and other operating and/or set-up parameters necessary to execute the operation.

3.11. **Material -** A general term referring to material at any stage in the manufacturing/repair process.

3.12. **NIST -** National Institute of Standards and Technology.

3.13. **Offeror -** Source furnishing a source approval package in an attempt to obtain engineering source approval to supply the approval part in its finished state to OC-ALC.

3.14. **Original Equipment Manufacturer (OEM) -** Term typically applied to the source responsible for the original design and development of a product or system. In this case it shall refer to sources primarily responsible for the design and development of aircraft gas turbine engines similar to the Pratt&Whitney F100 engine, for a US DoD activity or a NATO country.

3.15. **Production Quantities -** Quantities which establish a reasonable level of confidence in a prospective source's ability to consistently produce parts whose integrity is equivalent to that exhibited by parts which originally passed substantiation testing. As a minimum it shall be considered representative of several production lots or greater quantities commensurate with those specified in current solicitations or SA-ALC annual buy projections and shall be exclusive of quantities produced in experimental or developmental programs.

3.16. **Purchaser -** The Purchaser as defined in all applicable government specifications as well as all PWA specifications relative to the part described in this document shall refer to the OC-ALC contracting activity issuing the procurement requirement.

3.17. **QRSL -** Qualified Repair Source List, the listing of qualified repair sources, located in T.O. 2J-F100-13-1.

U.S. AIR FORCE

LPF-QR-001
BASIC TECHNICAL DATA REQUIREMENTS FOR FRACTURE CRITICAL AND DURABILITY CRITICAL PARTS

1. APPLICATION.

This specification applies to all F100 engine Fracture Critical Parts (FCP) and Durability Critical Parts (DCP).

2. PURPOSE.

2.1. This document is a supplement to established Qualification Requirements (QR) tailored to a specific part(s) for the purpose of defining the basic documentation required of prospective sources to substantiate proof of capability. It is not all inclusive and prospective sources shall note that satisfaction of all requirements defined by the specific QR applicable to the approval part is required to obtain engineering source approval. The basic documentation submitted by prospective sources shall be tailored to the requirements of the specific QR applicable to the approval part that defines specific criteria for proof of capability. All documentation provided as evidence of compliance with requirements specified herein shall be in English and in the Inch-Pound system.

2.2. QR's applicable to a specific part shall be made available to prospective sources upon request to OC-ALC/BC for parts which are not the subject of open solicitations. Requests concerning the latter shall be addressed to the procuring activity.

2.3. Prospective sources are advised that source approval consideration on most Fracture Critical Parts (FCP) is restricted to actual manufacturers of the approval part due to limitations in existing government expertise. Consequently, prospective sources are advised to verify as to whether or not the part(s) in which they are interested fall in this category prior to seeking source approval. Information in this regard may be obtained through OC-ALC/BC at any time or the procuring activity.

3. DEFINITIONS.

The following definitions shall apply as used in the context of QR's for Fracture Critical Parts and Durability Critical Parts unless otherwise stated in the specific QR.

3.1. **Approval Part/Item -** Part/Item for which source approval is sought.

3.2. Category 1 Offeror - A manufacturing/repair source, which in conjunction with their sub-vendors has performed all requisite processes on the approval part for Pratt & Whitney. Offerors in this category must provide documentation relevant to the approval part that satisfies all criteria specified under Proof of Capability in their respective QR's with the exception of those identified in 5.1.1, 5.1.2, and 5.2. In all cases the burden of proof shall reside with the Offeror. Approval by the OEM for a specific repair or item manufacture does not guarantee approval by OC-ALC/LPFR. Sub-vendors are subject to approval by OC-ALC/LPFR.

3.3. Category 2 Offeror - Manufacturing/Repair source, which in conjunction with their sub-vendors has performed all requisite processes on a similar part for an OEM. Offerors in this category must provide documentation relevant to a similar part(s) that satisfies all criteria specified under Proof of Capability. In all cases, the burden of proof lies with the Offeror. Approval by the OEM for a specific repair or item manufacture does not guarantee approval by OC-ALC/LPFR. Sub-vendors are subject to approval by OC-ALC/LPFR.

3.4. **Critical Characteristic -** A part feature which, if non-conforming would result in probable loss of aircraft due to direct part failure or by causing other progressive part failures.

3.5. Durability Critical Part - A highly stressed part which cannot be completely inspected nondestructively; failure of which will result in a significant maintenance burden.

3.6. **Fabricate -** The manufacturing steps necessary for the making of new parts.

3.7. **Fracture Critical Part -** A highly stressed part which cannot be completely inspected nondestructively; failure of which will result in loss of aircraft due to non-containment or power loss preventing sustained flight, as a direct result of part failure or subsequent progressive failures.

3.8. Inspection Method Sheets (IMS) - document used to describe the steps involved in executing an inspection or series of inspections to include tooling, gages, fixtures, dimensions and other parameters necessary to execute the required inspections(s).

3.9. **Major Characteristic -** A part feature which, if non-conforming, could compromise the function of the part, resulting in a significant maintenance burden and/or reduction in weapon system performance.

3.10. Manufacturing/Repair Process Sheets (MPS/RPS) - documents used to describe the steps involved in executing an operation or series of operations to include tooling, machinery, dimensions, speeds, feed rates, coolants, cutters, tape

numbers and other operating, process and/or set-up parameters necessary to execute the operation. At a minimum processes in Appendix A shall be fully defined.

3.11. **Material -** A general term referring to material at any stage in the manufacturing/repair process.

3.12. **NIST -** National Institute of Standards and Technology.

3.13. **Offeror -** Source furnishing a source approval package in an attempt to obtain engineering source approval to supply the approval part in its finished state to OC-ALC.

3.14. **Original Equipment Manufacturer (OEM) -** Term typically applied to the source responsible for the original design and development of a product or system. In this case it shall refer to sources primarily responsible for the design and development of aircraft gas turbine engines similar to the Pratt & Whitney F100 engine, for a US DoD activity or a NATO country.

3.15. **Production Quantities -** Quantities that establish a reasonable level of confidence in a prospective source's ability to consistently produce parts whose integrity is equivalent to that exhibited by parts that originally passed substantiation testing. As a minimum it shall be considered representative of several production lots or greater quantities commensurate with those specified in current solicitations or OC-ALC annual buy projections and shall be exclusive of quantities produced in experimental or developmental programs.

3.16. **Purchaser -** The Purchaser as defined in all applicable government specifications as well as all PWA specifications relative to the part described in this document shall refer to the OC-ALC contracting activity issuing the procurement requirement.

3.17. **Raw Material -** Ingot, bar, billet, or sheet stock used directly in the fabrication of the finished part or forgings/castings used in the fabrication of the finished part.

3.18. **Repair -** The processes and inspections necessary to restore parts to serviceable condition.

3.19. **Significant Process -** A process which is capable of producing alterations in the material structure of a part which cannot normally be evaluated without destructive testing and which can compromise the mechanical properties `and ultimately the reliability of the part. Examples of processes that are considered to be significant by OC-ALC are listed in Appendix A.

3.20. **Similar part -** A part that satisfies all of the specific criteria for similarity as defined in the QR's for the approval part.

3.21. **Sub-vendor -** A source supplying material, products, and/or services to the Supplier as required in the performance of the contract. This term applies to all facilities other than the Supplier's facility including those of the same company.

3.22. **Technical Order -** A technical manual published by the Air Force containing (in this case) technical information required to develop inspection methods and repair processes for aircraft engine parts.

4. SOURCE SUBSTANTION AND QUALIFICATION

4.1. Offerors must:

4.1.1. Document processes and sequences to be used.

4.1.2. Controls of significant/major changes.

4.1.3. Statistical process control of significant processes (ensure same sequence and same operations)

4.1.4. First Article Inspection

4.2. **Quality management shall have standard practices and enforcement, which are commensurate with the requirements specified by the Qualification Requirements:**

4.2.1. Part outsourcing

4.2.2. Software quality

4.2.3. Material Review Board (MRB)

4.2.4. Farming-out of processes

4.2.5. Corrective Action and Root Cause Investigation

4.2.6. Drawing conformance

4.2.7. New item and item repair quality audits.

4.2.8. Part Marking.

SOURCE APPROVAL PROCESS SUMMARY

Design Drawing

T.O.

▼

FC/DC, Life limited parts and critical parts key controls.

▼

Offeror substantiation/Qualification requirements

▼

Significant process definition

▼

Supplier and Vendor Substantiation/qualification

▼

Offeror self assessment

▼

Quality System Assessment

▼

Supplier Assessment

▼

External Audit (s)

▼

Source Approval

▼

Product Validation Review

5. DOCUMENTATION REQUIREMENTS.

5.1. Offerors must submit the following data on all parts referenced within their SAR in addition to data required in the QR:

5.1.1. Offerors self-assessment of quality program and areas of improvement.
5.1.2. Quality System description and how it meets this programs requirements
5.1.3. Supplier assessment and qualifications, and include a plan for how suppliers and vendors will maintain the approved quality program and statistical process control
5.1.4. External audits shall be conducted by the OEM and/or OC-ALC/LPFR.

5.1.5. A complete set of legible drawings for all assemblies, details, and sub-components. All dimensions shall be in the English System of Units.

5.1.6. A complete set of all specifications (top page only for Pratt & Whitney developed specifications) for all materials and manufacturing/repair processes identified on the drawings for the similar parts and sub-components thereof.

5.1.7. Substantiation of possession or the top page of all referenced Pratt & Whitney MCL standards.

5.1.8. Approval by the OEM for a specific repair does not guarantee approval by OC-ALC/LPFR. Sub-vendors are subject to approval by OC-ALC/LPFR.

5.2. Offerors shall include the following documentation on the approval part (Category I Offeror) or similar parts (Category II Offeror) to substantiate Proof of Capability:

5.2.1. Copies of purchase orders from purchaser to Offeror and Offeror to sub-vendors that define quantities ordered and all technical conditions or restrictions imposed. Copies of the most recent shipping documents applicable to the purchase order should also be provided. Shipping documents shall be stamped appropriately by the purchaser to indicate full release where on-site acceptance is specified by the purchase order. In addition, if the part was manufactured/repaired for Pratt & Whitney, the Pratt & Whitney Requirements Control Card and Quality Assurance Document should be provided. The fact that a sub-vendor is a Pratt & Whitney LCS Supplier shall not relieve the Supplier of the responsibility of conducting following-on quality assurance surveillance to ensure that sub vendors are providing conforming material.

5.2.2. A copy of the Manufacturing/Repair Process Sheets (MPS) and Inspection Method Sheets (IMS) employed in the production of the part(s). Evidence of

purchaser approval of the MPS is required. Summary of manufacturing/repair operations sheets, travelers, or routing sheets are not acceptable in lieu of MPS, except for some sheet metal parts. In the case of the latter routing sheets that define process sequence, forming tooling, non-conventional machining schedules, weld schedules, and braze schedules shall be provided. All schedules and technical control documents referenced in the MPS that specify process operating parameters shall be included. In all cases where an operation is governed by software, i.e., numerically controlled or automated operations a hard copy excerpt identifying manufacturing/repair process operating parameters must be provided. MPS shall remain confidential and may be stamped "proprietary" at the discretion of the Offeror. Failure to provide detailed MPS and IMS shall constitute grounds for disapproval.

5.2.3. Identification of all sub-vendors of significant processes and sub-components employed in the production/repair of the part(s) including the specific operations and/or sub-components provided by each sub-vendor. Sub-vendors are subject to approval by OC-ALC/LPFR.

5.2.3.1. For significant processes subcontracted, the Offeror must provide his method for insuring quality control and conformance to specification at the sub-vendor's plant. This should not only include identification of such procedures in the company Quality Manual but also physical evidence such as audit reports, surveys, and chemical and physical test reports. If receiving inspection cannot verify conformance to specification, then chemical and physical test data along with in-work process control data must accompany each lot.

5.2.3.2. Repairs performed by sub vendors shall be accomplished in accordance with work instructions specified in MPS, Inspection Method Sheets, schedules, and/or technical control plans which define the exact sequence of all production operations and all process variables and parameters of repair operations which may directly affect material structure, grain flow, mechanical properties, surface finish and/or direction or lay of the cutting action. The procedure shall also assure that work instructions have been approved by the Purchaser or the OEM specified by the applicable source certification requirements defined in section 6.4 of these QR's.

5.2.3.3. Certificates of test or conformance provided by sub vendors of significant processes are complete and supported by process data and numerical test results from and OEM-approved laboratory for the requisite testing, are representative of material received, and the material is in conformance with Purchaser requirements. Acceptance of incoming material based exclusively upon certificates of test/conformance shall be prohibited. Also, generic procedures such as "laboratory testing employed as necessary" are unacceptable. Specific test procedures utilized on wrought engine parts are required.

5.2.4. A summary of quality deficiencies experienced in fabrication/repair part during the last two years of production. The summary shall include but not be limited to all Material Review Board (MRB) actions, Quality Deficiency Reports (QDR's), Laboratory Quality Review Orders (LQROs), Supplier Report of Nonconformance (SRONs), Material Deficiency Reports (MDR's) and any other pertinent documentation as well as the coordination of the President or Facility General Manager, and the Quality Assurance Manager. Coordination of the government quality assurance representative shall be included as well if government source inspection was conducted. Actions taken to resolve deficiencies identified including repair, rework or replacement of parts as well as the source primarily responsible for initiating, developing, and implementing corrective actions and the status thereof must also be provided.

5.2.4.1. The quality acceptance standards imposed in routine production acceptance by sub vendors shall be complete and OEM approved and the test methods employed in routing production acceptance are sufficient to verify compliance with these standards.

5.2.5. A detailed description of major similarities and differences between the "similar" part(s) and the approval part.

5.2.6. A specific description of value added by the OEM to the approval part or similar part(s) including but not limited to performance of manufacturing/repair processes or inspections, supply of raw material, forgings, castings, or sub-components, quality assurance surveillance of sub-vendors of significant processes, use of OEM tooling, fixtures, gages, or inspection master hardware, and use of OEM MPS, IMS or other process related data not referenced on part drawings. The Offeror shall demonstrate capability to fulfill " value added " by Pratt & Whitney on the approval part as determined by OC-ALC/LPFR, as the cognizant OC-ALC Fighter Propulsion System Division Engineering Section.

5.2.7. A copy of summary of manufacturing/repair process sheets, travelers, or routing sheets that identify all *significant manufacturing/repair* processes **to be employed in the fabrication/repair of the approval part** for OC-ALC. This documentation is subject to approval by OC-ALC/LPFR. As such it shall include a provision for coordination on each page.

5.2.8. Identification of all proposed changes to the MPS and IMS submitted by Category I Offerors, as proof of capability. This requirement applies regardless of whether are not they are considered to be significant changes by the Offeror.

5.2.9. The Offeror must provide documentation to prove that their quality assurance system meets or exceeds the requirements as described in the attached document LPF-QAR-001.

5.2.10. If an Offeror has had a Quality or Process audit performed by the DoD or agent for the DoD in the last 3 years, the Offeror shall provide the findings and evaluation/rating.

5.3 TRACEABILITY

5.3.1 Fracture Critical Parts must also provide traceability to critical processes specified in Appendix A, so that quality escapes may be easily narrowed to a population.

6. SAR FORMAT.

6.1. Source Approval Requests (SAR's) should be submitted in a binder to preclude the loss of contractor data in handling. A hard or semi-hard cover notebook form (i.e. a three-ring binder or similar product), with a table a contents and tabs corresponding to the table of contents is preferable. This will significantly reduce the turn-around time for engineering evaluation as well as reduce the likelihood of oversight or loss of valuable data that could have a significant bearing on the outcome of the evaluation.

7. PRODUCT VALIDATION REVIEWS AFTER CONTRACT AWARD.

7.1. Contractor must provide an internal review and report for:
7.1.1. Measure changes from First Article Inspection/Product Verification Audit
7.1.2. Conduct review 6 months after contract award or 25 parts, whichever comes first.
7.1.3. Review
7.1.3.1. Print, planning operations, and part review
7.1.3.2. Measure process capability standards for critical processes and critical features.
7.1.3.3. MRB procedures
7.1.3.4. Corrective action reports, assessments, and timely action.
7.1.3.5. Visual inspection by Part Number
7.1.3.6. Part Marking
7.2. The Government and/or the OEM will perform these reviews as necessary to ensure compliance.

GRIZELDA LOY-KRAFT, Chief
F100 Engineering Source Approval
Fighter Propulsion Division
Propulsion Directorate

APPENDIX A

CRITICAL/SIGNIFICANT PROCESSES

The following examples are typical processes considered significant in that they are capable of producing alterations to material structures, mechanical properties, and ultimately, item reliability, if performed improperly, and cannot normally be evaluated without destructive testing.

MANUFACTURING ONLY:

1. Casting Processes
2. Forging Processes
3. Other Forming Processes
4. Broaching

MANUFACTURING & REPAIR:

5. Blending/Reworking
6. Heat Treatment and Surface Hardening Processes
7. Grinding
8. Drilling, Reaming, and Boring
9. Milling
10. Finish Turning
11. Electrochemical Machining Processes (Cavity Sinking, Drilling, Grinding, etc.)
12. Chemical Milling
13. Electro-Discharge Machining
14. Electro-Stream Drilling
15. Laser Beam Metal Removal Processes
16. Electron Beam Processes
17. Peening Processes
18. Welding/Fusion
19. Brazing
20. Soldering

21. Metal Electroplating Processes
22. Coating Processes including, but not limited to, the following:
    a) Plasma Spray
    b) Thermal Spray,
    c) Diffusion Coatings
    d) Thermal Barrier Coatings
23. Surface Finishing Processes including, but not limited to, the following:
    a) Honing
    b) Sutton Barrel
24. Blasting Processes including, but not limited to, the following:
    a) Aluminum Oxide
    b) Silicon Carbide
    c) Plastic Bead
    d) Glass Bead
25. Dimensional Inspection/Tolerancing
26. Non-Destructive Inspections, including, but not limited to the following:
    a) Fluorescent Penetrant
    b) Eddy Current
    c) Ultrasonic
    d) Laser Holography
    e) Magnetic Particle Inspection
    f) Visual Inspection
    g) Radiography

27. Water-jet Stripping
28. Assembly Procedures
29. Disassembly Procedures

U.S. AIR FORCE

[redacted]

1. APPLICATION.

1.1. This document applies to all qualification requirements for F100 engine parts designated as Fracture Critical or Durability Critical or as otherwise noted.

1.2. This document shall only apply to Category I Offerors. This restricts the availability of this waiver to those Offerors who have manufactured/repaired the actual approval part for its Original Equipment Manufacturer (OEM).

1.3. It does NOT provide conditions of waiver for the requirement for pre-award qualification of prospective Offerors. It is limited in scope to the specific elements of the qualification requirements specified herein.

1.4. Definitions of terms used in this document are located in LPF-QR-001.

2. CONDITIONS.

2.1. The requirement that the Offeror must have fabricated/repaired production quantities of the approval part for the OEM within the time period specified by the applicable qualification requirements may be waived in favor of a longer period of time provided that all of the following conditions are satisfied and documented by the Offeror:

2.1.1. There are NO outstanding quality deficiencies of significance.

2.1.2. There were NO significant quality deficiencies in the parts produced/repaired. This must be supported by a summary of all quality deficiencies experienced in the last two years of production/repair for the OEM with the coordination of the Offeror's Plant Quality Assurance Manager and either the Plant Vice President or the Plant General Manager.

2.1.3. There was NO significant value added by the OEM as described in LPF-QR-001, Paragraph 5.2.6. The Offeror shall also account for all significant processes that they did not perform on parts delivered to the OEM by identifying the source that performed the processes.

2.1.4. There have been NO significant changes in Manufacturing/Repair Process Sheets since the part was last produced/repaired for the OEM. Significant

changes shall include but are not limited to changes in the following: Processes used, process sequence, equipment used, tooling design, processing location, and principal operating parameters. The Offeror shall provide the following documentation as substantiation:

2.1.4.1. A copy of the OEM-approved manufacturing/repair process sheets employed in the production/repair of parts for the OEM

2.1.4.2. A copy of the proposed manufacturing/repair process sheets for use in the production/repair of parts for OC-ALC.

2.1.4.3. A facilities list identifying all equipment in-house at the time the parts were in production/repair for the OEM.

2.1.4.4. A current facilities list identifying all equipment in-house.

2.1.4.5. Identification of special tooling and gaging employed in the fabrication/repair and inspection of the parts for the OEM and evidence that it is still serviceable and in the possession of the Offeror or can be duplicated.

2.1.5. The time period specified by the qualification requirements shall not be waived for similar parts or for approval parts manufactured/repaired for sources other then the OEM.

The requirement for a specific quality plan, if required by the applicable qualification requirements, shall not be waived.

GRIZELDA LOY-KRAFT, Chief
F100 Engineering Source Approval
Fighter Propulsion Division
Propulsion Directorate

U.S. AIR FORCE

LPF-QAR- 001
GENERAL QUALITY ASSURANCE DOCUMENTS FOR F100 ENGINE FC/DC BREAKOUT COMPONENTS

1. APPLICATION.

These requirements apply to all F100 engine Fracture Critical Parts (FCP) and Durability Critical Parts (DCP).

2. PURPOSE.

2.1. This document establishes the minimum technical requirements the Offeror must satisfy to obtain engineering approval of their quality system for FCP/DCP applications. All documentation provided as evidence of compliance with requirements specified herein must be in English and in the Inch-Pound system. Engineering approval of Offeror's Quality Assurance System shall be valid for three years from the date of the OC-ALC letter notifying the contractor of approval.

3. REQUIREMENTS.

3.1. The Offeror must provide a Quality Assurance Manual that accurately portrays their current quality assurance system.

3.1.1. The Offeror's Quality Assurance System must comply with the requirements as described in this document and NATO AQAP-120, ISO 9002, ANSI 9002, or equivalent. Proof of compliance shall be provided and meet one of the following:

3.1.1.1. Certified to NATO AQAP-120, ISO 9002, or ANSI 9002 by the American National Standards Institute (ANSI) or the International Standards Organization (ISO) in Geneva, Switzerland, or

3.1.1.2. Approved by an Original Equipment Manufacturer (OEM) to an equivalent Quality Assurance System standard.

3.1.1.3. Evidence from DCMC or other appropriate government Quality Assurance Representative that Quality System is compliant to NATO AQAP-120, ISO 9002, ANSI 9002, or equivalent.

3.1.2. Proof of certification/approval must be provided and must be dated within the last three years. The decision to approve or disapprove the Quality Assurance

System shall only be made after a thorough review of the Offeror's Quality Assurance Manual by the cognizant engineering authority, OC-ALC/LPFR.

3.2. The Offeror must provide OEM documentation identifying the specific conditions/restrictions (i.e., specific P/Ns, components, processes, or material this status applies to, production testing required for material release, testing the supplier is authorized to perform, etc.) imposed by the OEM.

3.3. The Offeror must provide proof that their quality assurance plan has placed emphasis upon controlling processes to prevent generation of non-conformances and is supplemented by sufficient inspections or tests to assure effective process control.

3.4. The Offeror must provide procedures/specifications governing the control of significant processes proposed for use in the fabrication/repair of the approval item for assuring that:

3.4.1. Only Purchaser approved sources are used for raw material, significant processes, and major sub-components and adequate consideration is given to a source's capability and performance prior to placing an order.

3.4.2. The quality acceptance standards imposed in routine production acceptance both in-house and by sub-vendors are complete and approved by an OEM and the test methods employed in routine production acceptance are sufficient to verify compliance with these standards.

3.4.3. Fabrication performed in-house and by sub-vendors is accomplished in accordance with work instructions specified in manufacturing/repair process sheets, schedules, and/or technical control plans which define the exact sequence of all production operations and all process variables and all critical parameters of manufacturing/repair operations which may directly affect material structure, mechanical properties, surface finish and/or direction or lay of the cutting action. The procedure shall also assure that work instructions have been approved by the customer.

3.4.4. All inspection of characteristics, which serves as the basis for final acceptance of a characteristic, including in-process inspections, are performed in accordance with work instructions specified in inspection method sheets which define all characteristics specified on the applicable OEM drawings and Quality Assurance Documents (QAD's), the classification of each characteristic, the Acceptable Quality Level (AQL) for each classification of characteristic, sample size, frequency of inspection, the specific inspection methodology to be utilized, and the required instrumentation. The procedure(s) shall also assure that all inspection method sheets have been approved by the customer.

3.4.5. The Offeror must provide evidence that internal and sub-vendor audits have occurred, are adequate to insure quality of the end item and are addressed in the Offeror's Quality Plan. Specific Offeror audit procedures/guidelines which pertain to process and product audits shall, as a minimum substantiate the following:

3.4.5.1. Processes accomplished in-house shall be performed in accordance with work instructions specified in Manufacturing/Repair Process Sheets, Schedules, and/or Technical Control Plans which define the sequence of all production operations and all aspects and parameters of manufacturing/repair operations which may directly affect material structure, grain flow, mechanical properties, surface finish and/or direction or lay of the cutting action. The procedure(s) shall also assure that process sheets have been approved by the Purchaser or the OEM.

3.4.5.2. All inspection of characteristics, which serves as the basis for final acceptance of a characteristic, including in-process inspections, are performed in accordance with work instructions specified in Inspection Method Sheets which define all characteristics specified on the applicable OEM drawings and Quality Assurance Documents (QADs), the classification of each characteristic, the Acceptable Quality Lever (AQL) for each classification of characteristic, sample size, frequency of inspection, the specific inspection methodology to be utilized, and the required instrumentation. The procedure(s) shall also assure that all inspection method sheets have been approved by the Purchaser or OEM.

3.4.5.3. Unauthorized changes to work instructions which might directly affect the material structure, grain flow, mechanical properties, surface finish and/or lay of the cutting action or accuracy or reliability of component inspection must be approved the cognizant Fighter Propulsion System, Engineering Source Approval Section prior to production. The procedure(s) shall include responsibility, methods, and procedures for identifying significant changes in inspection methods or criteria, coordination internal approval of such changes, and assuring changes are not introduced in the production cycle without formal Purchaser approval. The procedure(s) must address processes performed by sub vendors as well as those performed in-house.

3.4.5.4. Strict adherence to the sequence, parameters, and all other significant process variables of manufacturing/repair operations defined on manufacturing/repair process sheets approved by the customer is maintained both in-house and at sub-vendors' facilities. Specific procedures for auditing and/or controlling requisite significant processes must be provided.

3.4.5.5. Dedicated equipment is properly maintained and calibrated IAW ISO 10012-1 and is capable of adequately performing its intended application.

3.4.5.6. General housekeeping and manufacturing/repair practices shall be addressed in the Quality Plan to ensure they do not adversely affect the quality of the end product.

3.4.5.7. In- process monitoring of principal manufacturing/repair and inspection practices, operating parameters, and process parameters which directly affect material structure, grain flow, mechanical properties, surface finish, lay of the material, and/or critical dimensions, and which are indicators of process effectiveness and efficiency. It shall include responsibility, methods and procedures for identifying variables and parameters to be monitored, developing and approving work instructions, identification of trends that signal process problems, and initiation of corrective actions.

3.4.6. Procedures for assuring that certificates of test or conformance provided by sub-vendors of raw material and significant processes are complete and supported by process data and numerical test results from an OEM-approved laboratory for the requisite testing, are representative of material received, and the material is in conformance with Purchaser requirements.

3.4.7. Adequate records are retained for documenting sub-vendor lists, sub-vendor quality ratings, layout inspection reports, all Purchaser and OEM approvals, component traceability, and objective evidence of conformance to product, process, and quality acceptance requirements; and are available to the Purchaser upon request.

3.4.7.1. Provide procedures for assuring the traceability of the repair history for repaired components.

3.4.8. Evidence of a system for controlling non-conforming material to ensure:

3.4.8.1. The classification of all non-conforming characteristics in terms of critical, major, and minor is approved by the Purchaser.

3.4.8.2. Final disposition of all non-conforming critical and major characteristics including rework and repair is approved by the Purchaser prior to implementation.

3.4.8.3. Effective control of non-conforming material at sub-vendor facilities.

3.5. The Offeror must provide a specific Quality Plan as described in the applicable quality system of paragraph 3.1 and IAW OC-ALC/LPFR documentation as requested in the specific Qualification Requirement.

3.5.1. The Offeror's Quality Plan shall address specifically how the Offeror intends to ensure the ongoing quality of the approval part and processes required in the manufacture/repair thereof and how this has been accomplished on similar components. The Quality Plan shall include the organization responsible for determining the requirements, factors typically considered in the determination, testing and surveillance conducted on sub vendors, testing laboratories used and the specific testing typically performed, subcontract quality requirements, and the specific paragraphs of the quality assurance document(s) that govern such aspects.

GRIZELDA LOY-KRAFT, Chief
F100 Engineering Source Approval
Fighter Propulsion Division
Propulsion Directorate