

# BAE Systems Combat Vehicles Supplier Quality Assurance AS9102 Requirement

February 04, 2021



# Scope

The intent of this document is to provide an understanding, and clarification as to what BAE Systems expects in AS9102B first article (FAI) documentation submittals. The purpose of FAI is to validate that product realization processes are capable of producing parts and assemblies that meet engineering and design requirements. A well-planned and executed FAI will provide objective evidence, proving the manufacturer's processes can produce compliant product and that they have understood and incorporated associated requirements. FAI will:

- Provide confidence that the product realization processes are capable of producing conforming product.
- Demonstrate that the manufacturers and processors of the product have an understanding of the associated requirements.
- Provide objective evidence of process capability.
- Reduce potential risks associated with production startup and/or process changes.
- Provide assurance of product conformance at the start of production and after changes outlined in this standard.

## **An FAI is intended to:**

- Reduce future escapes, risks, and total costs.
- Help ensure reliability of vehicle operation.
- Improve quality, delivery, and customer satisfaction.
- Reduce costs and production delays associated with product non-conformances.
- Identify product realization processes that are not capable of producing conforming product, and initiate and/or validate corrective actions.

## FAI Process (AS9102)

- What is it?
- First Article Inspection (FAI) is a process where the Supplier inspects the first piece manufactured to the Technical Data Package (TDP) and maintains a record on file.
- How does it work?
  1. First Article is Inspected
  2. Balloon Drawing created
  3. Inspection Results Recorded
  4. Inspection Approved or Rejected
  5. Inspection Results filed and maintained in accordance with our record retention requirements
  6. FAI Made Available to Customer if Requested
- How this impacts the Supplier?
  - ✓ Must conduct a First Article Inspection
  - ✓ Must maintain all FAI Records on File
  - ✓ Must submit FAI Records to Customer if required by the Purchasing Agreement

## FAI Process (AS9102)

### CDR085 First Article Inspection

- New CDR assigned when specified by the prime contract
- Uses the Aerospace industry's AS9102B format
- Requires approval prior to shipment
- Standard is available from SAE (<http://standards.sae.org/as9102b/> )
- The Contractor shall conduct First Article Inspection (FAI) in accordance with this document for all first time provided parts, AS9102B provides further guidance to this requirement. **Parts that have already been provided to BAE with no change in manufacturing process, manufacturing location, configuration or lapse of 24 months of production may have a BAE first piece, compliant to the Supplier Quality Assurance Manual, submitted and approved in lieu of an AS9102B first article.**
- FAI's shall be conducted, reviewed, submitted in accordance with the data submission instructions located in the SQAM and approved prior to the first shipment of product, utilizing a secure file transfer system to transmit documentation. Where changes require only a delta FAI, the delta FAI will be limited to the impact of the change only, and **shall be completed per AS9102B**. The customer reserves the right to review any/or all associated FAI documentation at its discretion.

## AS9102 format and documentation requirements

### **BAE Systems requires for all first articles requested per CDR 085 to include the following:**

- Completed AS9102 forms 1,2 and 3 (or equivalent forms that satisfy all of AS9102 form 1,2 and 3 requirements), or a compliant first piece is allowed for parts in continuous production as previously detailed on page 3.
- Fully ballooned or detail print for all top level item requirements. Note: top level prints that contain a BOM (bill of materials), must have their sub component items verified with their own first article.
- All submissions to include full certification package for materials, performance test criteria (ex: ballistics, vibration, shock) plating, welding, heat treat, age control certifications, NDT and control tests.
- Part marking picture to be included with package.

# Form 1 completion requirements:

Form field number

FORM 1 - PART NUMBER ACCOUNTABILITY

Sheet \_\_\_ of \_\_\_

1. Part Number:	2. Part Name:	3. Serial Number:	4. FAIR Number:
5. Part Revision Level:	6. Drawing Number:	7. Drawing Revision Level:	8. Additional Changes:
9. Manufacturing Process Reference:	10. Organization Name:	11. Supplier Code:	12. P.O. Number:
13. Detail Part: _____ Assembly FAI: _____	14. Full FAI: _____ Partial FAI: _____ Baseline Part Number (including revision level): Reason for Partial FAI:		

a) If above part number is a detail part only, go to field 19.  
b) If above part number is an assembly, go to the "INDEX" section below.

#	BAE Systems P&S Requirement
1	<b>Required entry:</b> Item number as presented on the PO line including suffix, i.e., 1234987*00.
2	<b>Required entry:</b> Description of the part as it appears on the top level drawing or PO line.
3	<b>Required when:</b> Parts are serialized, put in the serial number of the part inspected
4	<b>Not required:</b> Supplier may define a traceable identifier applicable to them.
5	<b>Required entry:</b> The part revision level as listed in the PO CQR.
6	<b>Required entry</b> Drawing number detailed on CQR attached to PO.
7	<b>Required entry:</b> Rev level of drawing attached to CQR.
8	<b>Required when:</b> A deviation to the print requirement is included in the PO, reference the approved ECN, RFV, or RFC #.
9	<b>Required entry:</b> Reference link traceable to the process used to produce the inspected item.
10	<b>Required entry:</b> Supplier's name. In the event a sub-tier is used list your name / sub-tier supplier name.
11	<b>Required when:</b> Supplier has multiple sites, include site number as listed in PO Header.
12	<b>Required entry:</b> PO number for the item used for the FAI.
13	<b>Required entry:</b> Mark the description that applies.
14	<b>Required entry:</b> Mark the description that applies. In the event a partial FAI is completed list the baseline part number and revision level, include reason for partial FAI as well.

Required: You must fill in this field.  
Required when: Must be filled in when a condition is met.  
Not required: You may or may not fill in this field, it is at your discretion.

Requirements or conditions of information to be put in field

# Form 1 completion requirements continued:

INDEX of part numbers or sub-assembly numbers required to make the assembly noted above.			
15. Part Number:	16. Part Name:	17. Part Serial Number:	18. FAIR Number:
19. Signature:		20. Date:	
_____ FAI Complete		_____ FAI Not Complete	
21. Reviewed By:		22. Date:	
23. Customer Approval :		24. Date:	

#	BAE Systems P&S Requirement
15	<b>Required when:</b> Assembly contains drawing BOM, or sub components listed on the print that require first article verification.
16	<b>Required when:</b> Description is listed on drawing.
17	<b>Required when:</b> Only required when serialized parts are used
18	<b>Required when:</b> Sub component first articles are required for an assembly. Otherwise it is at the suppliers discretion.
19	<b>Required entry:</b> Signature of person who prepared the FAIR with "printed name or stamp"
20	<b>Required entry:</b> Date signed month / day / year
21	<b>Not required:</b>
22	<b>Not required:</b>
23	<b>Required entry:</b> Signature and "printed name or stamp" of BAE Quality Representative who reviewed and approved the FAIR at BAE. Note: page 1 approval to be shipped with product.
24	<b>Required entry:</b> Date signed by BAE Systems P&S Quality Representative month / day / year

# Form 2 completion requirements:

## FORM 2 - PRODUCT ACCOUNTABILITY - MATERIALS, SPECIAL PROCESSES, AND FUNCTIONAL TESTING

Sheet \_\_\_ of \_\_\_

1. Part Number:	2. Part Name:		3. Serial Number:		4. FAIR Number:
5. Material or Process Name:	6. Specification Number:	7. Code:	8. Supplier:	9. Customer Approval Verification:	10. Certificate of Conformance Number:

#	BAE Systems P&S Requirement	#	BAE Systems P&S Requirement
1	<i>Same as Form 1 entry</i> Item number as presented on the PO line including suffix, i.e., 1234987*00	6	<b>Required entry:</b> Specification/Standard as listed in the drawing requirements, the material as listed, i.e., Plate per ASTM A36 or the special process criteria as listed on the drawing, i.e., ASTM B633, Class 2 SC 2
2	<i>Same as Form 1 entry</i> Description of the part as it appears on the top level drawing or PO line	7	<b>Not required:</b>
3	<i>Same as Form 1 entry</i> Required of unit inspected if parts are serialized	8	<b>Required entry:</b> Enter supplier name and location.
4	<i>Same as Form 1 entry</i> Supplier defines a traceable identifier	9	<b>Required when:</b> BAE special process is used enter Yes for CARC painting process, weld, or thermally cutting of armor steel. Enter N/A for all other processes.
5	<b>Required entry:</b> Reference note detailing materials and special processes. Each shall have a certificate attached to the FAI package. Enter the identification for the material or special process example zinc plating, heat treat, welding.	10	<b>Required entry:</b> Enter Certificate number, process approval number or traceable unique identification.



## Form 2 completion requirements Continued:

		#	BAE Systems P&S Requirement
11. <i>Functional Test Procedure Number:</i>	12. <i>Acceptance Report Number:</i>	11	<b>Required when:</b> A functional test is identified as a design characteristic, enter test procedure number.
		12	<b>Required when:</b> A functional test certification indicating that test requirements have been met is available.
		13	<b>Not required:</b>
13. <i>Comments</i>		14	<b>Required entry:</b> Signature of person who prepared and approved the FAIR for submittal to BAE Systems P&S with printed name or stamp
14. <i>Signature</i>	15. <i>Date</i>	15	<b>Required entry:</b> Date signed month / day / year



## Form 3 completion requirements continued:

#	BAE Systems P&S Requirement
1	<b>Same as Form 1 entry</b> <b>Required entry:</b> Item number as presented on the PO line including suffix, i.e., 1234987*00
2	<b>Same as Form 1 entry</b> Description of the part as it appears on the top level drawing or PO line
3	<b>Same as Form 1 entry</b> Required of unit inspected if parts are serialized
4	<b>Same as Form 1 entry</b> Supplier defines a traceable identifier
5	<b>Required entry:</b> Numeric value beginning at 1 and progressing in a logical sequence until all characteristics have a unique identifier. Number to match balloon # on drawing.
6	<b>Required entry:</b> Ballooned drawing or coordinates of drawing. Note: in the event it is not clear what coordinates correlate to what dimension clarification needs established.
7	<b>Required when:</b> Critical characteristics and Critical Safety Item (CSI) characteristics required. Major and Minor dimensions are not required to be identified but it is preferred.
8	<b>Required entry:</b> Requirement as specified on drawing, i.e., dimension with tolerance, hardness range, Zinc plating per ASTM B633 SC 2, etc.

#	BAE Systems P&S Requirement
9	<b>Required entry:</b> Actual measured results for each characteristic in the units specified on the drawing must be recorded. Where attribute data is required a pass or fail / accept or reject verification shall be listed. Where attribute data is verified with a dedicated gage, the gage number must be listed.  <b>Additional requirement: Images of marking applied to part (or tag)</b> May be digital photo or imprint from rubber stamp of markings applied to item including markings specified by drawing notes, markings specified in SQAM 7.2 and CARC markings specified in SQAM 7.3.  Images of markings specified on the drawing, i.e., rotation direction arrows, stenciling, etc. shall be including in the marking report.
10	<b>Required entry:</b> When a non-standard gage is used for attribute acceptance, record number traceable to the calibration of the gage or tool. When a standard gage (caliper, micrometer, tape measure, etc.) is used for attribute acceptance, record the type of gage used.
11	<b>Required when:</b> A VIR from BAE Systems is approved, and attached to the PO authorizing shipping product with non-conforming characteristics. (Supplier does not have MRB authority to authorize acceptance of non-conforming characteristics)
12	<b>Same as Form 2 entry</b> <b>Required entry:</b> Signature of person who prepared and approved the FAIR for submittal to BAE Systems P&S with printed name or stamp.
13	<b>Required entry:</b> Date signed month / day / year

# Revision history

Rev	Date	Change Description	Approved By	Change Request #
-	01/24/2019	New Document Release	James Dolan	BPMS-04387
01	02/04/2021	Reviewed, no changes	James Dolan	BPMS-06296