



Knolls Atomic Power Laboratory



Bechtel Atomic Power Laboratory

**Laboratory Procurement
Quality Assurance Requirements**

LABORATORY PROCUREMENT QUALITY ASSURANCE REQUIREMENTS

This document establishes quality assurance controls applicable to Laboratory purchase orders. The Seller is responsible for complying with the specific clauses of this document that have been invoked by the purchase order. These requirements may be in addition to other quality assurance controls included in drawings, technical ordering requirements, etc., identified elsewhere in the purchase order.

QA Clause 1 - Independent Inspection Function

Final acceptance inspections or tests to verify product acceptability shall be performed by personnel other than those who produced the characteristics under review. The Seller shall perform or have performed all of the inspections and tests required to substantiate product conformance to drawing, specification, and contract requirements on all items supplied as part of this order, and on all characteristics of those items. Characteristics include any dimensional, visual, functional, mechanical, electrical, chemical, physical, or material feature or property of the products.

QA Clause 2 - Inspection Point Plan

An Inspection Point Plan (which may be included as part of a process outline or manufacturing or fabrication procedure) which the Seller and their lower-tier suppliers will follow to assure the purchase order requirements will be met, shall be submitted to the Laboratory for approval prior to start of manufacture or fabrication. The Inspection Point Plan shall reference drawings and other documents (including applicable revisions) used to prepare the plan and shall cover all operations from starting material through final preparation for shipment or release, including applicable lower-tier suppliers' inspections.

Partial Inspection Point Plan submittals are authorized provided continuity of the total Inspection Point Plan is preserved through explicit identification (tie-in) on subsequent submittals. Each inspection operation identified in the Inspection Point Plan shall indicate the stage of manufacture or fabrication where the inspection operation is to be performed. All inspections which are final acceptance inspections in preparation for shipment shall be indicated by a symbol or other appropriate method.

After receipt of the Inspection Point Plan, the Laboratory will advise the Seller of inspections and tests that the Laboratory plans to perform or witness. These hold points may not be bypassed by the Seller without formal Laboratory authorization. When requested by the Laboratory, the Seller shall arrange for and accompany the Laboratory's representative(s) to the Seller's involved lower-tier suppliers.

QA Clause 3 - Special Processes Quality Plan

A quality plan shall be established by the Seller to define the specific actions that will be taken to meet the quality requirements related to special processes (e.g., welding, brazing, plating, cleanliness, detrimental material controls, heat treating, hard facing, nondestructive testing (NDT), electric discharge machining, electric chemical machining) contained in this order. The plan shall be submitted to the Laboratory for approval prior to the start of manufacturing or fabrication and shall include, as a minimum, the following:

- Identification of product or services to be obtained from a lower-tier supplier and the identification of the lower-tier supplier.
- A description of the inspections and tests that will be performed to control and evaluate the involved special processes.
- A description of the personnel and procedure qualification program to assure compliance with applicable codes, specifications, and standards.

QA Clause 4 - Lower-Tier Suppliers

Seller is responsible for the performance of their lower-tier suppliers and shall maintain a system to assure that all purchased materials, equipment, and services conform to order requirements, including:

- (a) Selection of qualified suppliers
- (b) Pass down of order requirements
- (c) Quality surveillance process and product verification of procured items and services, including a detailed review of all material test reports, inspection and test data, and personnel and procedure qualification documentation received from all lower-tier suppliers (including foreign suppliers) to assure that all applicable codes, specification and standards invoked in the Laboratory's purchase order requirements have been fully met for the products and services provided by the lower-tier supplier.
- (d) Effective information feedback and correction of non-conformances

QA Clause 5 - Material Test Reports

Material Test Reports (MTR's) verifying conformance with purchase order material specifications shall be obtained and submitted by the Seller. These MTR's shall report actual quantitative chemical and mechanical properties test data, as applicable, and shall accompany the shipment. The MTR shall consist of a reproduced legible copy of the certificate as supplied by the testing facility, or a statement that the results were taken from the original test report as furnished by the test facility. Copies of the MTR's supplied by the Seller shall identify the purchase order number and the drawing and item number (if applicable) and the heat number of the material that was used in the fabrication of the product.

QA Clause 6 - Material Traceability

The Seller shall be capable of finding all objective evidence for a particular piece of material, given only the marking on that piece of material. Heat numbers, or other identity control numbers, shall be maintained on parts to prove traceability to parent material inspection and test records. Identification control shall be maintained throughout all stages of receipt, storage, manufacture, assembly, and delivery. If not required for all parts of the order, applicability to specific parts will be indicated in the order. Bagging/tagging, or an alternate equivalent method of identification, is permitted for use on parts too small to be marked individually and when allowed by other purchase order requirements. Marking shall not interfere with the functional or quality aspects of the product.

QA Clause 7 - Calibration and Control of Measuring and Test Equipment

The Seller shall utilize appropriate gaging, measuring, and test equipment, and shall regularly calibrate inspection equipment using appropriate standards traceable to the National Institute of Standards and Technology or other nationally recognized standards. Standards established by the Seller for calibrating the measuring and test equipment used in controlling product quality shall have the capabilities for accuracy, stability, and range for intended use. Records of such calibration shall be maintained by the Seller. If the Laboratory's representative has reason to question the accuracy of the calibration, a recalibration of the questionable equipment may be required and witnessed.

QA Clause 8 – Discrimination of Measurement Equipment and Interpretation of Limits

Line-graduated or digital-readout measuring and testing devices shall be graduated to intervals of 10% or less of the specified product tolerance for the characteristic being measured. For characteristics with a single specified limit, the interval between graduations shall be equal to or less than the difference between the measured value and the specified limit. Unless otherwise specified on the applicable approved drawings or in the purchase order, all specified limits shall be interpreted as absolute limits. Therefore, dimensional limits, regardless of the number of decimal places, are used as if they were continued with zeros. Any deviation, however small, which is outside the specified limits is a noncompliance and must be resolved.

QA Clause 9 - Sampling Inspection

If the Seller proposes to use sampling inspection procedures in lieu of 100% inspection for acceptance, the Seller shall submit their proposed sampling procedures and obtain Laboratory approval prior to use. Submitted sampling plans shall be based on sampling tables specified in nationally recognized specifications or standards.

QA Clause 10 - Seller Maintenance and Retention of Inspection and Test Records

The Seller shall maintain all records that substantiate product conformance to the requirements of the purchase order. The records shall be protected from loss, deterioration, or damage. Unless otherwise specified by the Laboratory in the purchase order, these documents shall be retained for a period of three years after final payment.

QA Clause 11 - Recording and Reporting Inspection and Test Data

- A. All inspection and test data required by the order shall be legibly recorded on inspection data sheets or sketches and shall be traceable to the order item with information such as:
- Purchase Order Number
 - Drawing Number and Revision (if applicable)
 - Nomenclature of part, heat numbers and part serial numbers (if applicable)

- Identification of Nonconforming conditions, referencing the Laboratory's approval document
- Date of Inspection/Test
- Signature of inspector who performed the inspection

Completed inspection data sheets shall be available for review by the Laboratory representative or Government QAR if such on-site inspection is applicable to this order. The recorded data as described below shall be provided to the Laboratory at completion of the contract requirements.

1. All dimensions designated by a delta (Δ) symbol on the drawing or identified in the Technical Specification, and recorded as actual values.
2. All three or more place decimal dimensions shown on the face of the drawing shall be measured and recorded as actual values for each dimension and for each occurrence designated, except for thread dimensions checked with go/no-go thread gages. All geometric characteristics (concentricity, parallelism, perpendicularity, etc.) shown on the face of the drawing and/or in the purchase order, with a feature control value less than or equal to 0.010", regardless of the feature modifier, shall be measured and recorded as actual values.
3. All surface finishes shown on the face of the drawing and/or in the purchase order, and whose tolerances are **more** restrictive than the standard drawing tolerances, shall be measured and recorded as actual values.
4. All angles with a tolerance of ± 30 minutes or less shall be measured and recorded as actual values.
5. Threads may be checked with Go and No-Go thread gages and recorded as "OK to Gage", if the part meets limit. The major diameter of external threads and minor diameter of internal threads shall be measured and recorded. When threads are measured using the wire method, measure and record the size of wire used, the major diameter, the pitch diameter, and the minor diameter. In addition, the flank angles and lead shall be measured and recorded when the wire method is used.
6. Any characteristic not included in Sections 1-5 above, including two-place decimal dimensions, shall be listed on the data sheet, and if within tolerance, may be recorded as "OK".
7. Evidence of performance and acceptability of the results of all test requirements shall be recorded, including nondestructive testing and material qualification compliance. Where the involved test yields actual test values, they shall be recorded.
8. Inspection results which are not in accordance with purchase order requirements shall be indicated by a symbol (e.g., asterisk) adjacent to the recorded result. If the discrepant condition was accepted via a Degradation of Specification Requirements (DSR) Form, the DSR number shall be referenced on the data sheet.
9. The temperature of the item at the time which dimensional inspection was performed shall be entered on each data sheet.

10. A unique identification number of the measuring device(s) used to obtain the measurement.

11. All data and information entered on data sheets shall be entered in ink and shall be clear and legible with no write-overs, tape-overs, or obliterations of any type. Erasures are not permitted. Errors requiring correction shall be lined out with a single line and the corrected data entered adjacent to the lined out information. Each change or addition to data sheets shall be initialed and dated.

B. When "as-built" data is required by the drawings, technical specifications, or elsewhere in the purchase order, actual measured values of such dimensions and/or geometric characteristics shall be recorded. Techniques such as go/no-go gaging or visual inspection may not be used to inspect as-built dimensions.

EXCEPTIONS: Acceptability of fractional dimensions and geometric characteristics such as parallelism, perpendicularity, runout, etc. may be reported by notations such as [within .xx"].

QA Clause 12 - Personnel and Procedure Qualifications

The seller shall submit documentation which states that all testing, welding, nondestructive evaluations etc., including that performed by sub-tiers, will be performed in accordance with procedures that meet the requirements of applicable specifications and/or standards, and by personnel qualified in accordance with the applicable specifications and/or standards. The documentation shall be submitted for approval prior to initiating work and as a minimum include:

- A. The applicable specifications and/or standards, including revision dates, required by the order.
- B. The testing organization's name and address, if other than the Seller.

QA Clause 13 - Laboratory Access to Seller's Facilities

The Seller's (and Seller's lower-tier suppliers including foreign lower-tier suppliers) systems, facilities, personnel, equipment, and documentation associated with the product or service being procured shall be subject to audit, in-process surveillance, and/or source inspection by the Laboratory and/or Government Representatives at no additional cost to the Laboratory. The Seller will receive advance notification of the date planned for the audit, in-process surveillance, or source inspection.

QA Clause 14 – Laboratory Inspections and Release for Shipment

- A. Items on this order are subject to Mandatory Hold Points and/or Source Inspection by a Laboratory Representative. The Seller shall provide to the Laboratory, on a best estimate basis, three working days advance notice of when the items will be ready for witness, inspection, or review.
- B. When Source Inspection or other inspections are required, work shall not proceed beyond the inspection point, or shipment shall not be made, until the order items have been released by the Laboratory. This release may be provided at the time of the Source Inspection.

- C. When deficiencies in the Seller's operations are revealed by a Laboratory representative, a Deficiency Notice (DN) or Corrective Action Request (CAR) may be prepared and presented to the Seller who shall reply in writing to the Laboratory within the time period specified on the DN or CAR. The Seller's reply shall state the cause of the deficiency, the effect on other components or parts, the immediate corrective action taken or planned, and the action taken to prevent recurrence.

QA Clause 15 - Seller Final Inspection

Seller shall visually inspect 100% of completed components immediately prior to packaging and packing for cleanliness, quality of plating, identification, evidence of handling damage or surface discrepancies, assurance that the component is compatible with final assembly drawing configuration concerning orientation of parts, correct quantity of parts, completeness of assembly, correctness of installation of locking devices to the extent practicable without requiring disassembly, and for inclusion of correct quantities of associated hardware which are to be shipped unassembled.

QA Clause 16 - Certifications (General)

Certifications are required as specified in the purchase order. All certifications shall contain the following information and shall be submitted to the Laboratory on the Seller's letterhead. The Seller may choose to combine certification requirements into a single certification provided all information is included (e.g., Certificate of Conformance combined with Certification of Usage of Government-Furnished Material).

- A. Seller's Name and Address
- B. Purchase Order Number
- C. A listing of the items to which the certification applies, including:
1. Purchase order item numbers, description of, and quantity of each item in the shipment. Amendment changes to the contract applicable to the items being shipped shall also be listed on the certification.
 2. A list of all specifications, drawing numbers, catalog numbers, and material specification numbers, including applicable revisions.
 3. When applicable, a listing of Laboratory approved Degradation of Specification Requirements (DSRs) and Request for Engineering Changes (RECs), which authorize acceptance of nonconformances and engineering changes.
 4. A statement by the Seller certifying that the products and/or services conform with purchase order requirements; e.g., "(Seller's name)" hereby certifies that the products and/or services described herein meet the requirements of the purchase order, with the exception of approved Request for Engineering Changes and approved Degradation of Specification Requirements listed below".
- D. Date, signature, and title of the Seller's authorized representative.

QA Clause 17 - Certificate of Conformance

The Seller shall certify conformance to all purchase order requirements via a Certificate of Conformance. This certification shall be based on a review by the Seller, including a sampling of manufacturing and inspection records. In addition, when the Seller has made use of a lower-tier supplier (including foreign suppliers) for any portion of the work required by the purchase order, the Seller's Certificate of Conformance shall include a statement identifying that the Seller has completed a review of all material test reports, inspection and test data, and personnel and procedure qualification documentation received from the lower-tier supplier for compliance to all applicable codes, specification and standards invoked in the Laboratory's purchase order requirements. When requested in writing by the Laboratory, the Seller shall furnish objective evidence substantiating Seller's Certificate of Conformance.

QA Clause 18 - Certificate of Usage of Government-Furnished Material

When material is furnished by the Government (the Laboratory), the Seller shall certify that there was no substitution of Government supplied materials in completing the purchase order items and that materials were used as required in the purchase order. Material heat numbers (if applicable) shall be included in the Seller's certification of usage of GFM.

QA Clause 19 - Certificate of Returned Excess Government-Furnished Material

The Seller shall certify that excess material originally furnished by the Laboratory for use on the order has not been changed other than dimensionally, unless specifically approved by the Laboratory, and is being returned to the Laboratory. The certificate is only required to be submitted after delivery of all order items and shall include the information below:

- A. Quantity, description, and Laboratory identification control or heat number for the returned material.
- B. If changed other than physically (i.e., dimensionally), a description of the process (heat treatment, etc.) used, any generated data associated with the process, and reference to the Laboratory document which approved the process.

QA Clause 20 - Transmittal of Certifications, Inspection, or Test Data to the Laboratory

Three copies of each type of documentation required by the purchase order shall be supplied to the Laboratory.

- On source inspections orders, one copy will be given to the inspector.
- One copy of documentation shall accompany the shipment.
- The remaining copies shall be mailed, concurrent with the product shipment, to the Laboratory.

QA Clause 21 – Material Release

The Seller shall request the Laboratory's approval for the release to procure the required materials.

QA Clause 22 – Generic Alloy Testing

The Seller shall perform generic alloy testing of metallic starting material. The generic identity test shall be performed on all metallic material procured by, or supplied to the Seller, and subsequently a part of this order, unless otherwise noted. The generic test shall not damage the material. For material in an assembly procured by, or supplied to the Seller, generic tests are not required for those parts, which are not accessible without disassembly.

QA Clause 23 – Magnet Check

By using a known piece of carbon steel as a standard for comparison, the Seller shall conduct and record the results of a magnet check of all stainless steel (300 series), nickel-chromium, iron alloy (Inconel) and Zircaloy materials supplied on this purchase order to ensure that carbon steel has not been inadvertently used for the fabrication of the products. Results of this inspection shall be identified as "magnetic" or "non-magnetic" on the Inspection Data Sheet or Certification report.

QA Clause 24 – Nondestructive Testing (NDT) Documentation

The following nondestructive testing requirements apply when the specific nondestructive test is specified in the purchase order.

1. Radiographic Documentation

All radiographic films are subject to final review and approval by the Laboratory and shall be accompanied by the Seller's completed radiographic review form. The record shall identify the specific procedure employed (including procedure number, date and/or revision number) and the specific Laboratory approval document when applicable.

The Laboratory reserves the right to review the film on its premises or other such places as may be designated. In such cases, shipment of films shall be requested of the Seller in writing by the Laboratory. Submittal of film and radiographic review form shall be by registered mail. The Laboratory will assume responsibility for the films to the extent of liability for re-radiography, until they are returned to the Seller. A copy of the radiographic inspection record and radiographic technique sheet shall be submitted with the Seller's data package to the Laboratory, when applicable.

2. Ultrasonic Test Documentation

Ultrasonic test procedures shall be submitted to the Laboratory when procedure approval is required by the purchase order. Ultrasonic test procedures shall be detailed to the extent that the Laboratory is able to determine the adequacy and extent of the testing to be performed. When additional information such as position charts, sketches, etc., are pertinent, they shall be submitted with the procedures. Objective evidence of ultrasonic test performance (tapes, traces, charts, etc.) shall be retained by the Seller, and shall be made available for review by the Laboratory upon request. Documentation of approvals and qualification shall be maintained in the

Seller's records. At a minimum, the test report shall identify the Seller's ultrasonic test procedure employed (including procedure number, date, and/or revision number), personnel performing the inspection, and the results of the ultrasonic test including accept/reject disposition and description of indications by size and number, and be submitted with the Seller's data package to the Laboratory, when applicable.

3. Liquid Penetrant Test Documentation

The Seller shall record the results of liquid penetrant inspections. The records shall clearly specify the applicable specification, standard, and acceptance criteria identified in the purchase order. Documentation of approvals and qualification shall be maintained in the Seller's records. At a minimum, the test report shall identify the Seller's penetrant procedure employed (including procedure number, date, and/or revision number), the weld layers inspected, personnel performing the inspection, and the results of the penetrant test including accept/reject disposition and description of indications by size and number, and be submitted with the Seller's data package to the Laboratory, when applicable.

4. Magnetic Particle Test Documentation

The Seller shall record the results of magnetic particle inspections. The records shall clearly specify the applicable specification, standard, and acceptance criteria identified in the purchase order. Documentation of approvals and qualification shall be maintained in the Seller's records. At a minimum, the test report shall identify the Seller's magnetic particle procedure employed (including procedure number, date, and/or revision number), the weld layers inspected, personnel performing the inspection, and the results of the magnetic particle test including accept/reject disposition and description of indications by size and number, and be submitted with the Seller's data package to the Laboratory, when applicable.

5. Visual Test Documentation

The Seller shall record the results of visual inspections. The records shall clearly specify the applicable specification, standard, and acceptance criteria identified in the purchase order. Documentation of approvals and qualification shall be maintained in the Seller's records. At a minimum, the test report shall identify the Seller's visual inspection procedure employed (including procedure number, date, and/or revision number), the weld layers inspected, personnel performing the inspection, and the results of the visual inspection including accept/reject disposition and description of indications by size and number, and be submitted with the Seller's data package to the Laboratory, when applicable.

6. Other Acceptance Testing (e.g. Electrical, Hydrostatic, Helium Leak, etc.) Documentation

Test reports required for specific acceptance testing in the order shall be as issued by the organization performing the tests. The Seller shall record the results of the acceptance testing. The records shall clearly specify the applicable specification, standard, and acceptance criteria identified in the purchase order. Documentation of approvals and qualification shall be maintained in the Seller's records. At a minimum, the test report shall identify the Seller's testing procedure employed (including procedure number, date, and/or revision number), personnel performing the tests, and the quantitative or qualitative test results for each test of each unit of each order item, and be submitted with the Seller's data package to the Laboratory, when applicable.

QA Clause 25 - Government Source Inspection (GSI)

When this clause is invoked, GSI is applicable to the purchase order and the requirements of the clause apply. Upon receipt of this order, the Seller shall notify the Government Quality Assurance Representative (QAR) who normally services this facility, so that GSI may be performed. All lower-tier orders issued under this order which are approved by the Government QAR for GSI, shall invoke this clause.

Facilities, Access and Information Required

1. Facilities to be Furnished to the Government QAR
When requested by the Government QAR, the Seller shall provide adequate office supplies, office space, plain office furniture, and storage cabinets for drawings and documents, which meet applicable security requirements. The Seller shall present products for Government inspection in such a manner as to afford inspection conditions acceptable to the QAR.
2. Access to the Seller's Facility
The Government QAR may be assigned as itinerant or resident at the Seller's facility. He/she shall have immediate and free access at all times to all parts of the Seller's facilities utilized in the performance of work on the purchase order, and shall be permitted to examine and inspect the products, witness the processes of manufacture, and perform quality program and inspection system audits. The Government QAR assigned to the Seller's facility is there in the performance of duty with reference to the purchase order and not present at the will or by other grace of the Seller, but to protect the interest of the Government. He/she is under no obligation to waive compensation for any injury to person or property sustained in the performance of his/her duties, may refuse to sign a visitor's register or pass which includes such a waiver, or may delete the waiver clause before affixing his/her signature.
3. Information Required by the Government QAR
The supplier shall furnish or make available to the Government QAR all information that he/she considers pertinent to the proper inspection of the supplies or services. This includes copies of contracts, subcontracts, or internal orders on other supplier facilities, schedules, manufacturing processes, QA, or any other pertinent data.

Government Notification Requirements

1. Notification points are steps in the Seller's manufacturing and/or inspection sequence wherein the Government QAR shall be notified. These steps are identified to the Seller by the Government QAR who may require the Seller to submit or confirm notifications in writing. Notifications shall not be bypassed by the Seller unless authorization has been obtained from the Government QAR.
2. Unless otherwise agreed to in writing, the Seller shall notify the Government QAR at least two working days in advance of readiness of inspections and tests designated by the Government QAR as requiring witnessing or inspecting.

3. If any portion of the purchase order involving a notification point is to be performed by a lower-tier supplier, the seller shall notify the Government QAR prior to placing the purchase order with the supplier, to arrange for probable source inspection at the lower-tier supplier's facility.

Corrective Action Requests

The Seller shall reply in writing, within the time period requested, to any corrective action requests resulting from Quality Deficiency Reports (QDRs) issued by the Government QAR. The reply shall state the root cause of the deficiency, effect on other components or parts, immediate corrective action taken or planned, and action(s) taken to prevent recurrence.

Government Authorization to Ship Supplies

Supplies shall not be released for shipment until the Government QAR has signed a Material Inspection and Receiving Report (DD Form 250), or otherwise provides a release by signing and dating the packing list or other Seller shipping papers. At the time of each shipment under a contract or subcontract which specifies Government Inspection of supplies or services at source, the supplier shall prepare and furnish to the Government QAR, a Material Inspection and Receiving Report (DD Form 250) or other authorized inspection report form. Inspection report forms will be furnished to the supplier upon request. Supplies shipped without proper authority, or unaccompanied by an inspection report may be returned to the supplier at their expense for inspection, or inspection may be conducted at destination by the Government, and the cost of inspection may be charged to the supplier.

When the Government QAR requires a DD Form 250 for shipments made under the order, the Seller may obtain assistance in completing the forms from either the Government QAR or the Laboratory.