

ZA STANDARD

SUB-CONTRACTED SPECIAL PROCESSES QUALIFICATION AND MONITORING

Procedure

IDENTIFICATION

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SUMMARY

This document defines the requirements for qualification and monitoring of sub-contracted special processes

VALIDATION

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B	July 2015	Document rewritten Applicability to all Zodiac Aerospace Group	Michel Jacquaniello

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1 PURPOSE

This document defines the requirements for qualification and monitoring of special processes performed by Zodiac Aerospace suppliers

Note: In the frame of this document Non Destructive Tests (NDT) performed by suppliers during product manufacturing are considered as special processes.

This procedure is intended to be distributed to suppliers that meet applicability criteria defined in § 2 .

2 APPLICABILITY

This procedure is applicable to All Zodiac Aerospace Business Units

This procedure is applicable when:

- Supplier does not hold design responsibility (Sub-Contractor, Service Provider or Repairer according to ZA-Q-1030)
- Special process requirements referenced called on drawing and/or purchase order refer to :
 - Zodiac Aerospace Business Units specification
 - End Customer specification (Boeing, Snecma...)
 - International standard (AMS, ASTM, MIL...)

This procedure applies also when special processes are sub contracted by Supplier to its own sub-tier suppliers.

If the supplier has a NADCAP qualification and the Zodiac Aerospace drawings and/or purchase order recall an international special process specification included in the scope of the NADCAP qualification it is not required to perform Zodiac Aerospace qualification if actions defined in § 6.3 are fulfilled.

This procedure does not apply where the Supplier designs and manufactures parts for which it holds design responsibility and utilizes its own special processes (Engineered Product Manufactured supplier or Commercial Component Off the Shelf Supplier according to ZA-Q-1030).

3 RELATED DOCUMENTS

AS/EN 9100:	Quality management system – Requirements for Aviation, Space and Defense organizations
ISO 9001:	Quality management system – Requirements
AC7004:	NADCAP Audit Criteria for Quality Management System
EN 4179:	Qualification and approval of personnel for non-destructive testing
NAS 410:	Certification and qualification of nondestructive test personnel
ZA-Q-1030:	Requirements applicable to Zodiac Aerospace suppliers

4 TERMINOLOGY

4.1 Definition

Special Process:

A manufacturing process where the resulting output cannot be verified by subsequent monitoring or measurement and as a consequence, deficiencies become apparent only after the product is in use or has been delivered.

Note: Definition of special processes is Zodiac Aerospace Business Unit responsibility

Process Qualification Responsible:

Party from Zodiac Business unit or Supplier, responsible to manage and coordinate and carry out all qualification activities defined § 8 of this document.

Process Qualification Responsible can carry out himself qualification activities or can delegate some activities. (e.g process audit)

Process specification:

Statement of requirements to be satisfied by a process (e.g thickness, salt spray corrosion resistance, hardness, tensile strength...). The requirements are to be expressed in exact numerical terms describing applicable limits.

Process specification can be :

- Zodiac Aerospace Business Unit document
- Customer document
- Standard (e.g. MIL , ASTM, ISO,...)

Design Authority:

An organization responsible for the design definition of a part or assembly. The design definition includes the drawing and all referenced specifications required to manufacture and inspect the product

Major non-conformity:

A non fulfilment of a requirement regarding process specification and/or process control (formalization and/or implementation) that leads or may result in nonconforming product.

Minor non-conformity:

A non fulfilment of a requirement regarding process specification and/or process control (formalization and/or implementation) that does not or may not result in nonconforming product.

4.2 Acronyms

NADCAP:	Performance Review Institute / National Aerospace and Defense Contractor Accreditation Program
NDT:	Non-destructive Test
PFMEA:	Process Failure Mode and Effect Analysis
PQR:	Process Qualification Responsible

5 GENERAL

All special processes shall be qualified before utilization in order to demonstrate

- Process ability to be compliant with technical requirements
- Process ability to continuously produce part compliant with technical requirements

Qualification tests are usually conducted on test samples and are used to demonstrate ability of process to achieve technical requirements (Salt spray test, destructive tests ...)

Process audit is used to verify that process is conducted in accordance with process control requirements and able to ensure repeatability and traceability (documented instructions, process parameters identified and controlled operator's qualified records...)

Final Qualification is granted if:

- Process outputs meet technical requirements
- No major nonconformance identified relating to process control

6 RESPONSIBILITY

6.1 Qualification performed by Zodiac Aerospace

Zodiac Aerospace Business Unit is responsible to perform qualification process according to § 8

For each subcontracted special process to be qualified, Process Qualification Responsible (PQR) shall be assigned by Zodiac Aerospace Business Unit.

PQR is responsible to manage and carry out all activities defined in § 8 including qualification decision.

PQR shall have a sufficient knowledge of process to be qualified.

6.2 Qualification delegated to Supplier

Based on supplier ability to manage special processes, qualification and monitoring activities can be partially or fully delegated to Supplier.

- **Partial Delegation:** Supplier is responsible to carry out activities define in § 8.1 to 8.4 and shall submit to Zodiac Aerospace for review the qualification file as defined in § 8.4.3 prior to qualification decision
- **Full delegation:** Supplier is responsible to carry out all activities defined in § 8 including qualification decision.

Note : delegation apply to special process performed by the supplier or subcontracted to sub-tier

Supplier's ability is assessed by Zodiac Aerospace Quality Supplier representative during on site audit and/or by review of existing certification.

Verification of supplier's ability to manage special processes shall include at least.

- Existence of internal procedures compliant with requirements defined in § 8
- Availability of trained and qualified special process auditors
- Evidence of special process qualification activities

Delegation is granted by BU Quality Manager (or delegated) and shall be formalized between Supplier and Zodiac Aerospace BU and shall include:

- Scope of delegation
- Limitations if any
- Condition of monitoring

6.3 Qualification delegated to NADCAP

6.3.1 Special process requirements defined by international standard

Unless otherwise specified by Zodiac Aerospace Business Unit, NADCAP accredited special processes are considered as qualified according to the requirements of § 8 if the following conditions are fulfilled:

- Zodiac Aerospace Business Unit drawing and/or PO refer to International Standard (AMS, MIL-STD, ISO...) or to Customer specification

- Supplier is NADCAP accredited for the relevant special process
- Scope of accreditation includes reference to the relevant international standard or Customer specification specified on drawings and/or purchase orders

Qualification is valid as long as the above conditions are maintained

Qualification requirements defined in this section apply to special processes performed by Supplier and their sub-tiers.

Qualification requirements defined in this section apply to initial and renewal qualification

Zodiac Aerospace Business Unit can request the Supplier to communicate the list of NADCAP accredited sub-tier qualified according to this section.

Note: NADCAP scope of accreditation, audit report and associated data are available in NADCAP database. PQR is responsible to review and analyse these reports and data.

6.3.2 Special process requirements defined by Zodiac Aerospace specification

Unless otherwise specified by Zodiac Aerospace Business Units, Readiness Process review and process audit as defined in § 8.1 and 8.3 are delegated to NADCAP if the following conditions are fulfilled:

- Supplier is NADCAP accredited for the relevant special process
- Zodiac Aerospace supplemental checklists (if any) are included in audit scope

Above conditions apply to special processes performed by Supplier and their sub-tiers and for initial and renewal qualification.

Verification of compliance with technical requirements is not delegated to NADCAP for initial audit. Compliance shall be verified in accordance with § 8.2

For renewal audit, compliance with process specification can be delegated to NADCAP only if evidence of relevant job audit performed by NADCAP on Zodiac Aerospace parts within 18 months.

7 REQUIREMENTS RELATED TO QUALITY MANAGEMENT SYSTEMS

Suppliers performing special processes on Zodiac Aerospace products shall be certified at least to one of the following QMS standards:

- AS/EN 9100
- AC7004
- ISO 9001

If supplier is not certified according to one of the listed standards, the supplier shall provide an acceptable quality plan

Consistency and implementation of this quality plan shall be reviewed and validated by Zodiac Aerospace Business Unit Quality Supplier Representative.

8 QUALIFICATION PROCESS

8.1 Process readiness review

Process Qualification Responsible (or delegated parties) shall review availability and consistency of the following data

Data related to process requirements:

- Process technical specification defining requirements to be satisfied by the process :
 - Specific document issued and controlled by Design Authority or
 - Standard
- Qualification plan
 - Tests to be carried out for qualification
 - Type, material, size and number of test sample or parts to be tested
 - Criteria for acceptance

Note 1: When process requirements are defined by a standard, it is the responsibility of the Design Authority to define and formalize tests to be carried out. Without Engineering Department instruction all tests specified in the referenced standard shall be carried out.

Note 2: Typically, a Qualification Plan is part of the process technical specification

- Process operating specification defining requirements regarding process control (if applicable)

Data related to process control

- Process identification and layout
- Process key characteristics and associated control plan (PFMEA is the recommended tool to identify process key characteristics)
- Work instructions (operating procedure, parameter setting, monitoring instructions...),
- Test and Inspection instructions specifying the acceptance criteria,

Note: For NDT, work instructions and test and inspection instructions shall be validated by Level 3 operator according to EN4179 or NAS410

Data related to operators

- Training and qualification procedures for operators
- List of qualified operators (including evidence of qualification)

In case of deviation a nonconformity report shall be established.

Note: use of checklists (e.g. relevant NADCAP checklist) are recommended to perform process readiness review

8.2 Qualification tests

8.2.1 Test samples or qualification parts realization

Test samples and/or parts used for qualification testing shall be representatives of process outputs:

- Applicable operating procedures and means
- Qualified operators.

Traceability between test samples and/or qualification parts and process control records (traveler sheet, process parameters...) shall be established and retained.

Process Qualification Responsible shall witness test samples and/or Qualification part realization

Note: depending of process time, partial witnessing is acceptable

8.2.2 Tests realization

Test shall be conducted in accordance with test procedure defined in Process Technical Specification and /or with applicable standard referenced.

NDT testing shall be performed by operators certified to Level 2 according to according to EN4179 or NAS410

Test devices and means used shall be calibrated and validated according to applicable standards defined in Process Technical Specification and/or Qualification plan.

Operators performing tests shall be qualified and evidence of qualification should be made available.

Deliverable :

- Test report including at least the following information:
 - Reference and type of test specimen,
 - Methods and test standards used,
 - Reference and description of the test or inspection means used,
 - Values measured in comparison with expected values,
 - Date of the test
 - Identification of operator
 - Test decision (compliant or non-compliant) in relation to the technical specification requirements.
 - A general conclusion shall summarize any potential deviations and final result

Test reports shall be verified and endorsed by Process Qualification Responsible.

8.3 Process Audit

Audit is performed by Process Qualification Responsible (or delegated parties) to ensure that process is operated and controlled according to applicable procedures and work instructions

Audit shall address at least:

- Operator qualification
 - For NDT operators, they shall be qualified according to EN4179 or NAS410. Level of qualification depends of task to be performed.
- Compliance with work instructions
- Calibration and maintenance
- Monitoring and controls of key process parameters
- Cleanliness and organization of workshop and work station
- Handling, storage, packaging

Note: Process Qualification Responsible or delegated parties shall be qualified auditors and have sufficient knowledge in relevant special process to effectively evaluate process performance

Deliverables:

- Audit report

- Non conformities report (if any)

8.4 Qualification

8.4.1 Non conformities management

All major nonconformities issued during qualification tests and/or process audit shall be closed before qualification decision.

Any deviation regarding technical requirements shall be accepted by Design Authority before qualification decision.

Note: If needed Zodiac Aerospace Experts may provide support for non-conformity review and decision

8.4.2 Qualification decision

Depending upon the results of tests performed and result of audit, the Process Qualification Responsible decides to implement one of the following decisions:

- Qualification accepted (see note 1)
- Qualification accepted with limitation (see note 1)
- Rejection of qualification.

Note 1: when special process qualification activities are carried out by Supplier with partial delegation (see 6.2), supplier Process Qualification Responsible shall submit for review the qualification file as defined in § 8.4.3 prior to any qualification decision

Qualification decision must be prepared and formalized by Process Qualification Responsible

8.4.3 Qualification File

The Process Qualification Responsible shall prepare a qualification file including as a minimum the following elements:

- Identification and detailed description of the process qualified
- Documents and/or procedures used to qualify (or identification of these documents with their revision issue),
- Audit report
- Test reports,
- Non-conforming report
- Deviation acceptance report evidence
- Qualification Decision report.

The qualification file shall be retained for at **least 10 years after the end of validity**

9 QUALIFICATION MAINTENANCE

9.1 Qualification Renewal

Qualification renewal shall be planned as a minimum every **3 years**. This qualification renewal shall be performed in accordance with paragraph § 8.

Note: This frequency may be reduced according to the problems encountered on the products.

A complete qualification process is conducted after any operational interruption lasting longer than 24 months.

9.2 Re Qualification After Changes

According to ZA-Q-1030 any change pertaining to:

- Process layout and process location
- Process Equipment
- Operating conditions (setting parameters...),
- Control of process key parameters

Shall be communicated to the initial Process Qualification Responsible who may decide to perform all or part of the qualification process as defined in § 8.1 to 8.3.

In all cases, changes must be recorded in the special process qualification file.

Note: Any change in process specification shall lead to partial or full new qualification process.

10 LIST OF QUALIFIED SUB CONTRACTED SPECIAL PROCESSES

10.1 Qualification performed by Zodiac Aerospace Business Unit

Zodiac Aerospace Business Unit shall establish and maintain record of subcontracted special processes qualified according to § 6.1

This record shall include:

- Name of sub-contractor
- Identification of special process qualified
- Process requirements specification identification
- Qualification decision report reference
- Date of qualification
- Expiration date of end qualification validity
- Limitations (if any)

Note 1: Qualification granted by another Zodiac Aerospace Business Unit is acceptable provided that process specification is accepted by BU and process qualification has been performed according to § 8

Note 2 : Summary of qualified subcontracted special processes can be part of approved/qualified suppliers record

10.2 Qualification delegated to supplier

Zodiac Aerospace Business Unit shall establish and maintain record of suppliers for which special processes qualification has been delegated in accordance with § 6.2

This record shall include,

- Name of supplier
- Level of delegation granted (full or partial)
- Identification of special process qualified
- Limitations (if any)

Note 1: record of delegated suppliers can be part of approved supplier record

Delegated Supplier shall establish and maintain a record of subcontracted special processes qualified according to § 6.2

- This record shall include :
- Name of sub-contractor
- Identification of special process qualified
- Process requirements / specification identification
- Qualification decision report reference
- Date of qualification
- Expiration date qualification validity
- Limitations (if any)

10.3 Qualification delegated to Nadcap (6.3.2)

Special process subcontractors qualified by Nadcap according to § 6.3.1 shall be listed in supplier approved record

Special processes subcontractors qualified by Nadcap according to § 6.3.2 shall be part of special process qualified record as defined in § 10.1 or 10.2 (depending on qualification decision responsibility)