DEFINITIONS

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1 SCOPE:

1.1 This specification defines terms commonly-used within Engineering Specifications, Materials Specifications, Process Specifications and Quality Specifications. Section 4 describes the types of specification.

1.2 Some Rolls-Royce specifications use local definitions that either supplement or supersede the definitions herein.

2 APPLICABLE DOCUMENTS:

2.1 The following publications form a part of this document to the extent specified herein. The applicable version shall be the current version, unless a particular document version is specified.

2.2 When the referenced document has been cancelled and no superseding document has been specified, contact the Raynesway Standards Office for clarification.

2.3 In the event of a conflict between the text of this document and external (non Rolls-Royce) references cited herein, this document shall take precedence.

2.4 National standards and industry standards are available from IHS.

BS 499-1 Welding terms and symbols - Glossary for welding, brazing and thermal cutting

3 DEFINITION OF TERMS:

Accreditation Body A body that conducts and administers an accreditation system and grants accreditation to certification bodies. For a list of accreditation bodies refer to the International Accreditation Forum at http://www.iaf.nu.

Approval Written confirmation that a documented procedure, material or organization meets the requirements of the appropriate requirement or specification. In all cases where Rolls-Royce has given approval, the supplier remains fully responsible for the quality of the product delivered/affected by the implementation of such actions.

Approved The word ‘approved’ refers to the formal approval of a specific task/application by Rolls-Royce. In all cases where approval has been given by Rolls-Royce, the supplier remains fully responsible for the quality of the product delivered/affected by the implementation of such actions.

Assembly A combination of one or more detail parts that are joined together. There are two types: separable assemblies (e.g., fitted, bolted) and inseparable (permanent) assemblies (e.g., welded or brazed).

Attribute A characteristic or property that is appraised in terms of whether it does or does not conform to a given requirement.

Autogenous Weld A fusion weld made without addition of filler material.
Authorisation

Written confirmation that a person or organization has been empowered by letter, form or Quality Plan to grant approval. In all cases where Rolls-Royce has given authorisation, the supplier remains fully responsible for the quality of the product delivered/affected by the implementation of such actions.

AS/EN/JISQ

AS – Aerospace Standard
EN – European Norm
JISQ – Japanese Institute for Standard Quality

AS/EN/JISQ 9100

AS/EN/JISQ 9100 is a quality management system for the aerospace industry which incorporates the requirements of ISO 9001 plus additional aerospace industry requirements.

AS/EN 9102

First Article Inspection Requirement. This standard establishes requirements for performing and documenting the First Article Inspection (FAI). The purpose of FAI is to give objective evidence that all engineering, design and specification requirements are correctly understood, accounted for, verified, and recorded.

AS/EN 9103

Variation Management of Key Characteristics. This standard is primarily intended to apply to new parts, but can also be applied to parts currently in production. The standard shall be applicable to all production processes that influence the variation of Key Characteristics. This standard is designed to drive the improvement of manufacturing processes through adequate planning and effective management of Key Characteristic variation.

Backi

Material placed at the reverse side of a joint preparation for the purpose of supporting molten weld metal.

Batch

A collection of products that share the same product characteristics and configuration and that are produced by the same production process at the same source at the same time or in an unbroken sequence using a given set of materials.

Bill of Material

A Bill of Materials (BOM) is a list of the raw materials, sub-assemblies, intermediate assemblies, sub-components, components, parts and the quantities of each needed to manufacture a product.

Billet

A formed product shape intended for further working.

Blend

The requirement specifying a smooth transition where there is a mismatch of surfaces.

Buttering

The addition of material, by welding, on one or both faces of a joint, prior to the preparation of the joint for final welding, for the purpose of providing a suitable transition weld deposit for the subsequent completion of the joint.

Capability

The ability of an organization, system or process to realize a product that will fulfil the requirements for that product.
Capacity Planning  Capacity is the maximum amount of work that an organisation is capable of completing in a given period of time and therefore capacity planning is the process of determining the production capacity needed by an organisation to meet changing demands of the product/customer.

Capability Statement  A capability statement is a simple form of technical justification. The capability statement shall document an inspection’s capability to detect specified defects, based on physical reasoning, simple practical evidence (if available and relevant) and Suitably Qualified and Experienced Personnel (SQEP) engineering judgement.

Cascade Diagram  An illustration of product and sub assembly products subject to First Article Inspection within a top level assembly.

C of C  Certificate of Conformity.

Certification Body  A body that conducts certification conformity ie A certification body that conforms to ISO/IEC 17021 and is accredited to provide audit and certification of quality management systems.

Characteristic  A distinguishing feature of a product or process related to a requirement.

Characteristic Matrix  A characteristic matrix is an analytical technique for displaying the relationship between process parameters and manufacturing process activities.

Circular Indication  Any indication whose larger dimension is less than three times the size of the smaller dimension.

Cladding  A metal coating bonded onto another metal under high pressure and temperature.

Class A material  Implementation of First Level requirements in accordance with SSCP25/SSP25. Refer to material classification for more details.

Class B material  Implementation of Non-First Level requirements in accordance with SSCP25/SSP25. Refer to material classification for more details.

Classified Part  A part whose engineering classification is critical, sensitive or unclassified.

Coating  A layer of material, added to the surface of a part by one of a variety of methods, for the purpose of changing the surface properties or protecting the part from damage (eg, paint, plate or thermal spray).

Competence  Competence is the demonstrated ability to apply knowledge and skill.
Component

Any part that is required to make the whole assembly. This is equally applicable for rigs, fixtures and tooling as it is for product parts. The word ‘component’ includes an assembly providing that it constitutes an inseparable assembly.

Component Definition

The definition against which the component is inspected. The component definition comprises two elements: the master model geometry and component definition drawing.

Complex Lift

A complex lifting operation is defined using the criteria detailed in the Health, Safety and Environmental Lifting Standard and Guidelines document.

Concession

The authorisation to use, release or supply a limited quantity of a completed or partially-completed product or service, which does not comply with the specified requirements.

Condition of Supply (COS)

An item that requires further machining, manufacture and/or processing steps before the item is ready for assembly.

Configuration Management

A management activity that applies technical and administrative direction over the life cycle of a product, its configuration items, and related product configuration information.

Conformance Control Feature (CCF)

A performance requirement, attribute or feature of a component that has a large effect on the acceptability of that component to fulfil its function by suitable verification. Each Conformance Control Feature (CCF) shall be measured, recorded, assessed, approved and copied as appropriate for the Quality Assurance documentation pack.

Control of work transfers (source change)

A source change (control of work transfers) is used to control and verify that the product conforms to requirements during and after a temporary or permanent transfer of work.

a) From the supplier’s facility to another facility
b) From the supplier’s facility to a subcontractor/sub-tier supplier
c) From a subcontractor/sub-tier supplier to the supplier’s facility
d) From one subcontractor/sub-tier supplier to another subcontractor/sub-tier supplier
e) Any transfer of work within the supplier’s facility that could have an effect upon the continuity of supply.

Control of work transfers (source change) is NOT applicable to:

a) Purchased Commercial off the Shelf (COTS) items
b) A proposed source that holds a current valid First Article Inspection Report (FAIR) for the product or service
c) Raw material purchased from a stockist/distributor
d) Rolls-Royce indirect purchase contracts.

Conventional Machining

The use of tools such as saws, lathes, milling machines and drills to physically remove material.
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition/Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conversion</td>
<td>Use of a mechanical or thermo-mechanical process to convert master heat material or master powder blends into intermediate forms intended for subsequent working eg Forging, Hot Isostatic Pressing, extrusion, swaging and rolling.</td>
</tr>
<tr>
<td>Corrective Action</td>
<td>Action taken to eliminate the cause of a detected nonconformity or other undesirable situation.</td>
</tr>
<tr>
<td>Commercial Off The Shelf (COTS)</td>
<td>A standard catalogue product where the manufacturer may own the intellectual property rights where there is no Rolls-Royce design input for the product.</td>
</tr>
<tr>
<td>Critical</td>
<td>The engineering classification applied to a part whose primary failure is shown as having a hazardous effect and that requires special controls to achieve an acceptably low probability of occurrence.</td>
</tr>
<tr>
<td>Cross-function Team</td>
<td>A cross function team (also known as an integrated product/programme team) typically includes the organisation’s design, manufacturing/production, engineering quality, service and other appropriate personnel.</td>
</tr>
<tr>
<td>Cure Date</td>
<td>The date on which the curing process occurred during production of an elastomeric product.</td>
</tr>
<tr>
<td>Customer</td>
<td>The organization or person that receives a product or service.</td>
</tr>
<tr>
<td>Cycle Time</td>
<td>The period required to complete one cycle of an operation; or to complete a function, job or task from start to finish.</td>
</tr>
<tr>
<td>Data Acquisition Engineer (DAE)</td>
<td>The DAE role is tasked with collecting and ensuring quality of the inspection data. For automated inspections the interpretation of inspection data is typically completed by a separate Data Interpretation Engineer (DIE). However, for manual inspections the DAE and DIE may be a single role.</td>
</tr>
<tr>
<td>Data Card</td>
<td>See ‘work instruction’.</td>
</tr>
<tr>
<td>Data Interpretation Engineer (DIE)</td>
<td>In the context of NDT, the DIE role is responsible for the interpretation, sizing and characterisation of any indications of interest. However, for manual inspections the DAE and DIE may be a single role.</td>
</tr>
<tr>
<td>Defined Feature</td>
<td>The overall geometric shape and tolerance defined on a component definition.</td>
</tr>
<tr>
<td>Definition Alteration Request (DAR)</td>
<td>Definition Alteration Request (DAR) is applicable to: definition changes that do not affect fit, form or function, changes that impact upon Rolls-Royce requirements, changes that require a decision by Rolls-Royce.</td>
</tr>
</tbody>
</table>
Deliverable Quality Plan (DQP) Document that specifies how a Supplier’s Quality Management System (QMS) applies to Rolls-Royce requirements by defining the controls related to the activities, processes, responsibilities and resource required.

The DQP shall satisfy the requirements of AQAP-2105: NATO Requirements for Deliverable Quality Plans

Demineralised Water Demineralised water shall be tested prior to use and shall have:

- No visible turbidity (check this first to ensure a valid sample).
- A pH value in the range of 5.5 to 8.0 at 25°C.
- A fluoride content not exceeding 0.1 mg/kg.
- A chloride content not exceeding 0.1 mg/kg.
- A sulphate content not exceeding 0.1 mg/kg.
- A conductivity not exceeding 2.5 μS/cm at 25°C; ultra-pure demineralised water has an indicated conductivity of < 0.1 μS/cm (resistivity of 18 MΩ cm).

Dent Surface deformation of a component.

Depression A hollow resulting from the removal or rectification of any unacceptable feature, defect or discontinuity.

Design The application of product understanding and proven technologies to create/maintain a product that will perform its function through-life.

Design Failure Mode Effects and Analysis (DFMEA) DFMEA is used to analyse component designs. It focuses on potential failure modes associated with the functionality of a component caused by design. A DFMEA evaluates how a product can fail, and the likelihood that the proposed design process/design will anticipate and prevent the problem. DFMEA challenges the design rationale establishing potential weaknesses of a design.

Design and Development Quality Plan (DDQP) A document which details how the Supplier’s Quality Management System complies with requirements as described in RRES 90009.

Development The process of transforming requirements into specified characteristics or into the specification of a product, process or system.

Deviation Permit Permission to depart from the specified requirements prior to product manufacture. This permission operates for a limited quantity of product and on no account may it be allowed to extend to another contract without a further application.

Ding Impact witness mark on a component.

Direct Purchase A direct purchase is a product or service (or a product or service embodied within a product configuration/assembly) that will be provided to the external customer or Rolls-Royce.
Direct Supplier  A supplier that delivers parts or services to fulfil a Rolls-Royce purchase order.

Discontinuity  An interruption in the normal physical structure of a material.

Distributor  A retailer or stockist of goods eg raw material, products. Activities include the purchase, storage and sale of goods in a manner that conforms to requirements.

Document  Information and its supporting medium. The medium can be paper, magnetic, electronic or optical computer disc, photograph, master sample, or a combination thereof.

Documented Procedure  A procedure that is documented and specifies the way to carry out an activity or a process.

Dunnage  Dunnage is the materials used to provide adequate support, bracing and protection of product during shipment ie padding in a shipping container to prevent unnecessary movement of load.

eConcession  Electronic concession – electronic creation and approval of deviation permit/concession.

eFAIR  Electronic First/Last Article Inspection Report – electronic creation and approval of a FAIR/LAIR. Current eFAIR system provider is Net-Inspect.

Enhanced Manufacturing Inspection (EMI)  A qualified inspection capable of detecting credible defects of structural significance. The EMI is qualified to a level proportionate to its contribution to the safety case, which is noted to be less demanding than an MAI.

Engineering Control (EC)  EC designation may be applied to an operation or element of an operation that affects the performance, integrity or durability of the part. Any change to an EC item requires Rolls-Royce approval.

Manufacturing operations designated as EC are subject to Rolls-Royce governance.

Error Proofing  The implementation of mechanisms that reduce the risk of a process producing defects.

Essential Variable  A process variable is considered ‘essential’ if it has a significant effect on a product characteristic. A change in the essential variable beyond the limits prescribed will necessitate requalification of the work instruction. In the context of welding, supplementary essential variables are required for materials that will undergo notch-toughness tests.

Fastener  A component that is used to secure two or more items together by virtue of its tensile strength, eg bolt, screw, nut or stud.
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final Surface</td>
<td>A surface that will be subjected to no further operations, e.g., material removal or addition.</td>
</tr>
<tr>
<td>Finishing Operation - Machining</td>
<td>Any operation, up to and including the last 0.5 mm stock removal, to achieve the final component definition dimension.</td>
</tr>
<tr>
<td>Finishing Operation - Component</td>
<td>Any operation that completes the component in accordance with the product definition, e.g., forming, heat treatment, surface dressing, cleaning, packaging etc.</td>
</tr>
<tr>
<td>First Article Inspection (FAI)</td>
<td>First Article Inspection (FAI) is used to independently verify that the production processes, production documentation and tooling are capable of producing products that meet the requirements by providing objective evidence that all engineering, design and specification requirements are correctly understood, accounted for, verified and recorded.</td>
</tr>
<tr>
<td>First Article Inspection Report (FAIR)</td>
<td>First Article Inspection Report (FAIR) includes the forms and associated documentation for a product or assembly, including FAI results.</td>
</tr>
<tr>
<td>First Level</td>
<td>Equipment for which a single failure during normal, abnormal or emergency operation could cause unacceptable consequences.</td>
</tr>
<tr>
<td>Fixed Process Control</td>
<td>Fixed process control is used to ensure effective Rolls-Royce control of the source and/or method of production for features or processes that could have a significant impact on product safety or reliability.</td>
</tr>
<tr>
<td>Fixed Process Document (FPD)</td>
<td>A documented process method of manufacture or repair, subject to audit, for which equipment, operation, sequence, methods, parameters, and control techniques are established and sealed by the approval of Rolls-Royce.</td>
</tr>
<tr>
<td>Fixtures and Tooling</td>
<td>Fixtures and tooling are special purpose tools which are used to facilitate production (manufacturing, assembling and inspection operations).</td>
</tr>
<tr>
<td>Flaw</td>
<td>An unintentional, unexplained, or unwanted interruption in the integrity of a component.</td>
</tr>
<tr>
<td>Foreign Object Debris (FOD)</td>
<td>A foreign object may be regarded as a substance, debris or article that is alien to a product. Examples of foreign objects include (but are not limited to) alumina grit, glass beads, swarf, burrs, fibres, resins, powders etc.</td>
</tr>
<tr>
<td>Functional Testing</td>
<td>The verification/validation of a product characteristic to a requirement.</td>
</tr>
<tr>
<td>Gas Purge</td>
<td>In the context of packaging, use of a pressurised, dry, inert gas within a sealed container or within a sealed component to preserve the cleanliness within the packaging or environment of a component.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Gas Purge</td>
<td>In the context of welding, an inert gas atmosphere created at the back of, or inside, a component to protect it from oxidising when exposed to the heat of the welding process.</td>
</tr>
<tr>
<td>Gauge Reproducibility &amp; Repeatability (R&amp;R)</td>
<td>A gauge R&amp;R study is used to quantify measurement error as a percentage of the process tolerance or process spread.</td>
</tr>
<tr>
<td>Global Supplier Portal (GSP)</td>
<td>The Global Supplier Portal <a href="https://suppliers.rolls-royce.com">https://suppliers.rolls-royce.com</a> is a secure, web-based work area that provides information and enables interaction between suppliers and Rolls-Royce.</td>
</tr>
<tr>
<td>Groove Weld</td>
<td>US term for a ‘butt weld’. BS 499-1 defines a ‘butt weld’.</td>
</tr>
<tr>
<td>Group (or family) of products</td>
<td>A product group (or family) refers to products that share the same or similar characteristics related to fit, form, function, configuration and are produced by the same production process at the same source.</td>
</tr>
<tr>
<td>Hand Dressing</td>
<td>The removal of material to create features, or removal or rectification of defects and discontinuities by an operation using hand tools (including power tools) and abrasives.</td>
</tr>
<tr>
<td>Hazardous (material)</td>
<td>Refer to the Control of Substances Hazardous to Health (widely known as ‘COSHH’) Regulations.</td>
</tr>
<tr>
<td>Heat-Affected Zone (HAZ)</td>
<td>The portion of the base metal that has not been melted, but whose microstructure has been altered by the heat of welding or cutting.</td>
</tr>
<tr>
<td>Hold Point/Witness Point</td>
<td>A hold point is a mandatory stop in manufacture to enable review by Rolls-Royce or our customer of documented evidence to that stage that all operations have been performed satisfactorily.</td>
</tr>
<tr>
<td></td>
<td>A witness point is a physical witness of an operation by Rolls-Royce or our customer.</td>
</tr>
<tr>
<td>Independent</td>
<td>Autonomous and free from influence, control, relationship, action, judgment or guidance.</td>
</tr>
<tr>
<td>Indication</td>
<td>The response or evidence from the application of a Non-Destructive Examination (NDE) method prior to interpretation or analysis. Its size shall be the longest dimension.</td>
</tr>
<tr>
<td>Indirect Purchase</td>
<td>An indirect purchase is a product or service procured for consumption by internal stakeholders (business units or functions) rather than the external customer of Rolls-Royce.</td>
</tr>
</tbody>
</table>
Industrial Water

Industrial water (previously known as ‘mains water’) shall be tested prior to use and shall have:

a) No visible turbidity (check this first to ensure a valid sample).
b) A pH value in the range of 5.5 to 8.5 at 25°C.
c) A chloride content not exceeding 50 mg/kg.
d) A copper content not exceeding 1 mg/kg.

Industrial water can be obtained or made up from any source or combination of sources (e.g., mains water mixed with demineralised water) providing it complies with this specification.

Industry Standard Part

A part or material that conforms to an established industry or national authority published specification, having all characteristics identified by text description, national/military standard drawing or catalogue item. See ‘proprietary’.

Ingot

A casting, usually from a master heat, intended for conversion or re-melting.

Inspection

Formal examination of an item to assess its physical characteristics.

Inspection Plan

An inspection plan provides a detailed description of inspection activities (e.g., tolerances, methods, gages) related to product and/or process characteristics to be performed during specific manufacturing operations.

Inspection Qualification (IQ)

The formal process for demonstrating that the reliability and performance of a Non-Destructive Testing (NDT) inspection system (equipment, procedure and personnel) achieves the specified defect detection and sizing requirements with a level of performance demonstration appropriate for the specified qualification level. IQ typically involves production of a Technical Justification (TJ) and blind and/or open trials.

Intellectual Property Rights (IPR)

Intellectual Property Rights (IPR) – is a legal term that refers to discoveries, inventions, words, phases, symbols and designs. Some common types of IPR are copyright, patents, industrial design rights and the rights that protect trademarks and trade secrets.

Background IPR – means IPR that are developed by, owned by or which become owned by a party independently from its activities under a particular contract i.e., where an organisation provides the design input regarding the product characteristics, process characteristics and performance characteristics and holds the core competence and capability to design the product. For design/make organisations, this also includes the core competence and capability related to the production processes used.

Foreground IPR – means any new IPR that are developed, intended, discovered, made, originated, or created during the course of activities under a particular contract i.e., where Rolls-Royce provides the input specification regarding product requirements related to product characteristics, process characteristics and performance characteristics.
Interpass Temperature

The highest temperature in the weld, and adjoining base metal, immediately adjacent to the welding heat source. In the case of multiple pass welds, the highest temperature of the base metal adjacent to the weld, immediately before the start of the next pass.

ISO

International Standards Organisation

ISO 9001

ISO 9001 is a set of internationally agreed standards that provide guidelines for a Quality Management System.

BS EN ISO 9001 certification (that includes testing calibration activities)
The Scope of approval of an ISO 9001 certified organisation would specify any testing and/or calibration that is conducted as an in-house laboratory activity and would refer to these activities being used to support their in-house production activities (first party only).

ISO 10007

ISO 10007 – Quality management systems – Guidelines for configuration management.

ISO 10012

ISO 10012 – Measurement management systems – Requirements for measurement processes and measuring equipment.

ISO 18490

Non-Destructive Testing (NDT): Evaluation of vision acuity of NDT personnel. Specifies the form of the prototype, the quality requirements for the chart, the test procedure, and the acceptance level for near vision acuity of NDT personnel. It also addresses the qualification requirements for personnel permitted to carry out the test. Only addresses near vision acuity under defined conditions similar to those encountered during routine NDT inspection. It does not address an individual’s overall visual acuity and users are advised to consider the need for a general eye examination by specialist medical personnel to ensure general vision acuity is appropriate for job function. BS EN ISO 18490 does not address colour vision requirements.

ISO/IEC 17025

The ISO/IEC 17025 standard specifies the general requirements for the competence of testing and calibration laboratories. This scope of ISO/IEC 17025 certification is applicable to all organisations performing test and/or calibrations and can be conducted to support the following:

a) First-party laboratories (in-house)

b) Second-party (external customer)

c) Third-party (independent) activities

d) Laboratories where testing and/or calibration forms part of inspection and product certifications.

Item

A non-specific term used to denote any component, unit, assembly or product.

Key Process

A business which is regarded by an organisation’s top management as being critical to customer satisfaction, competitive advantage, or the success of the organisation’s strategy.
Key Product Characteristic (KPC)  
Key Product Characteristics (KPCs) require verification evidence of the actual result eg a record of the actual value measured, photographic evidence of an operation having been performed satisfactorily.

KPCs will be identified on the product.

Key Subcontractor/sub-tier supplier  
A supplier that is regarded as being critical to the continuity of supply and the success of the organisations strategy.

Large Bore Pipe or Tube  
Any pipe or tube whose Nominal Pipe Size (NPS) is greater than 80 mm.

Last Article Inspection (LAI)  
The Last Article Inspection (LAI) in conjunction with the First Article Inspection (FAI) demonstrates product equivalence at the end of production and provides a benchmark of the production system prior to implementing a source/method change or making the production system dormant.

Last Article Inspection Report (LAIR)  
An assessment of the production system prior to changing source or method, or hibernating the production system.

Lead Time  
The period from the point at which the customer places an order to the point at which the customer receives the product.

Lifting and Manoeuvring Device  
A device that carries an object from one location to another. Lifting devices can include, but are not limited to, cranes, hoists, forklifts and air skates (air skates are a platform supported by a layer of pressurised air that allows the component or object to be manoeuvred).

Linear Indication  
Indication of a flaw, defect or discontinuity with a length more than three times the width.

Lot  
See ‘Batch’.

Lux  
The lux is a unit of illumination and luminous emittance.

Mains Water  
See ‘Industrial Water’.

Manufacturing Acceptance Inspection (MAI):  
The MAI is undertaken to detect credible defects of structural significance and also structurally significant defects in the principal stress planes. MAI is subject to inspection qualification.

Manufacturing Engineering Control (MEC)  
MEC designation may be applied to an operation or element of an operation that does not affect the performance, integrity or durability of the part.

Manufacturing operations designated as MEC are subject to supplier governance.
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing Instruction</td>
<td>A package that identifies a complete manufacturing route or sequence for a component, component repair or assembly.</td>
</tr>
<tr>
<td>Master Heat</td>
<td>A quantity of alloy processes through melting and refining that are subject to subsequent qualification by compositional analysis and additional testing required by the applicable material specification.</td>
</tr>
<tr>
<td>Matched Set</td>
<td>A group of two or more parts of an assembly whose manufacturing process requires that they remain together in the same assembly throughout their useful life.</td>
</tr>
<tr>
<td>Material</td>
<td>The substance of which an item is made or composed.</td>
</tr>
<tr>
<td>Material Classification</td>
<td>The material classification is stated on the product definition and is controlled as follows:</td>
</tr>
<tr>
<td></td>
<td>a) Class A is the highest material quality level, with two key requirements:</td>
</tr>
<tr>
<td></td>
<td>i. Full traceability. Records are to demonstrate traceability back to the raw material source, inspection, and certification. Note that the source identification is to be evident on the final item, and hence is to be maintained throughout all manufacturing stages.</td>
</tr>
<tr>
<td></td>
<td>ii. Full certified records of all the significant material attributes eg chemical composition, mechanical properties, cleanliness checks, purity checks, heat treatment, and material testing as required by the material specification and/or the product definition.</td>
</tr>
<tr>
<td></td>
<td>b) Class B is the second highest material quality level. Full traceability is not required, but a C of C is required that records that the material complies with the product definition requirements.</td>
</tr>
<tr>
<td></td>
<td>c) Unclassified is the lowest material quality level. There are no specific requirements other than a statement regarding the material stockist/distributor and a C of C.</td>
</tr>
<tr>
<td>Material Group</td>
<td>Particles of a material may contact the surface of another material within the same group without affecting the material state, metallurgical properties or chemical composition of the surface. The supplier shall prevent contact with a surface belonging to a different material group. The material groups are as follows.</td>
</tr>
<tr>
<td></td>
<td>a) High alloy steel characterised by ≥5% Cr or ≥5% Ni (stainless steel, including Jethete)</td>
</tr>
<tr>
<td></td>
<td>b) Low alloy steel characterised by &lt;5% Cr and &lt;5% Ni (ferritic steel and chromium molybdenum)</td>
</tr>
<tr>
<td></td>
<td>c) Nickel-based alloy (including Inconel and Monel)</td>
</tr>
<tr>
<td></td>
<td>d) Cobalt-based alloy (including Haynes)</td>
</tr>
<tr>
<td></td>
<td>e) Copper-based alloy (nickel aluminium bronze and phosphorus bronze)</td>
</tr>
<tr>
<td></td>
<td>f) Lead-based alloy</td>
</tr>
<tr>
<td></td>
<td>g) Reactor core materials</td>
</tr>
<tr>
<td></td>
<td>Any other system of material groups could cause contamination and shall not be used.</td>
</tr>
</tbody>
</table>
### Materiel
All items used in the production of a component (e.g., tools, manufacturing equipment, ancillary devices, protective equipment and lubricant). Depending on context, ‘materiel’ might include the finished component.

### May
The term ‘may’ refers to a permissible practice or action. It does not express a requirement.

### Measurement
A set of operations used to determine the value of a quantity.

### Measurement System Analysis (MSA)
Measurement System Analysis (MSA) is an experimental and mathematical method of determining the nature of the variation within a measurement process and how this contributes to overall process variability; and the proportion of the tolerance consumed by the measurement system.

For guidance refer to:

### Melt Charge
The material stock used in the initial melting process.

### Metallographic Examination
Optical examination to reveal the constituents and structure of the base metal and the weld. Macroscopic examination refers to magnifications up to x10, whilst microscopic examination refers to magnifications up to x50. The surface may be chemically etched.

### Micro-Porosity
A region of porosity where the diameter of each individual pore does not exceed 0.25 mm measured optically on a clean surface.

### Mill Certificate
A document that certifies that a particular lot of material meets a specific set of requirements including the mill source, the master heat identification number, the production date and the specifications to which the material complies.

### Mismatch
Any offset of adjacent surfaces typically caused by misalignment and/or unintended freedom of movement of the fabrication equipment or tooling.

### Monitor
An arrangement for observing, detecting or recording the operation of a process or system.

### Monitoring/Measuring Equipment
Monitoring/measuring equipment are the devices used to monitor and/or measure a product or process and should use the same units of measurement as stated on the product definition.

### MOTS
Modified Off The Shelf (MOTS) is a standard product (COTS) that can be modified after purchase to suit the needs of the user.
Mult | A piece of stock, cut from bar or billet, from which a forging is made, also known as a ‘multiple’ or ‘slug’.

Must | The word ‘must’ refers to legislative or regulatory requirements to be complied with.

Nadcap | A worldwide co-operative programme of major companies designed to manage a cost effective consensus approach to special processes/products and provide continuous improvement within the aerospace and automotive industries – see also Performance Review Institute (PRI) http://www.pri-network.org/PRI/

National Standard Part | A part that is defined by a national (industry) standard development organization.

NCAGE Code | North Atlantic Treaty Organization (NATO) Commercial and Government Entity (CAGE) Code. A five-character alphanumeric code assigned to NATO organizations located in member nations (excluding USA) and other foreign countries that manufacture and/or control the design of parts supplied to a Government Military Activity or Civil Agency.

Note: Rolls-Royce NCAGE code is K5086.

New Product Introduction (NPI) | Refers to the introduction of a new product definition to the supplier’s business and manufacturing/production facilities.

New Weld | A weld following complete removal of the heat-affected zone of the base metal at the joint preparation. The supplier shall remove a thickness of at least 3 mm to meet this criterion.

Nonconforming product | A nonconforming product, also referred to as non-conformance and non-conformity, is where any aspect of the product does not conform to the product definition, the material or process specification, or any other requirement.

Non-conventional Machining | A process that removes metal without the use of cutting tools (eg, Electro-Discharge Machining).

Non-Destructive Testing Datasheet | The NDT datasheet contains the inspection specification in terms of the defects that need to be detected and/or sized by the applied inspection system. It shall be communicated in a Component Specific Rationalised Quality Standard (RQSC) or other similar document, referenced from the product definition.

Non-essential Variable | A variable is ‘non-essential’ if a change in the variable does not require requalification of the work instruction.

Non-First Level | Products determined as not hazardous and hence not first level.
Non-relevant indication
An indication caused by a phenomenon other than a defect.

Note
Information for guidance in understanding or clarifying the associated requirement.

Operation
Any chemical, metallurgical, non-metallic, machining or Non-Destructive Examination (NDE) process used during manufacture or repair of a component or assembly.

Operational Offload
The placement of specific operations into a lower tier of the supply chain.

Optometric Examination
A series of tests performed by an ophthalmologist, optometrist or orthoptist assessing vision and ability to focus on and discern objects, as well as other tests and examinations pertaining to the eyes.

Organization
A group of people and facilities with an orderly arrangement of responsibilities, authorities and relationships eg company, corporation, firm, enterprise, institution, charity, sole trader, association, or parts or combination thereof.

Overall Equipment Effectiveness (OEE)
Overall Equipment Effectiveness (OEE) is a set of metrics used to evaluate and indicate how effectively a manufacturing operation is utilised. 

\[ \text{OEE} = \text{Availability} \times \text{Quality} \times \text{Performance} \]

Part
A non-specific term used to denote any component, unit, assembly or product.

Performance Based Non-Destructive Testing (NDT)
The term used to describe an inspection where the system (equipment, procedure, scanning and reporting criteria) is designed to detect specific defect types and sizes defined in a datasheet. The datasheet is linked to an understanding of defect morphologies associated with the manufacturing process, with analysis supporting defect sizes requiring reliable detection and rejection. Performance based NDT is used as an umbrella term to encompass the following manufacturing inspection terms MAI, EMI and SMI Review; and may also be used in the context of In-Service Inspection (ISI).

Personal Certificate in Non Destructive Testing (PCN)
PCN is a United Kingdom based certification scheme in accordance with BS EN ISO 9712. Other systems of personnel certification may be employed and where applicable this will be specified in the relevant standards.

Pipe
A long hollow cylinder that transports plant operating fluid, typically between components.

Plating
A surface coating in which metal is deposited on a conductive surface.
Policy
A policy is typically described as a principle or rule to guide decisions and achieve rational outcome(s). The term is not normally used to denote 'what' is actually done: this is normally referred to as a procedure.

Post-Weld Heat Treatment
The application of heat to a weld subsequent to a welding or thermal cutting operation to relieve stress or modify the microstructure.

Predictive Maintenance
Activities based on process data aimed at the avoidance of maintenance problems by prediction of likely failure modes.

Preheat
The application of heat to the base metal before and during a welding or thermal cutting operation to achieve a specified minimum temperature.

Preventive Maintenance
Planned action to eliminate causes of equipment failure and unscheduled interruptions to production, as an output of the manufacturing process design.

Primary Packaging
Primary packaging is the first level of packaging applied to the product.

Procedure
A specified, stepwise and controlled way to carry out an activity or a process.

Process
A set of interrelated or interacting activities, which transforms inputs into outputs.

Process Audit
A review of a process to verify its effectiveness and compliance to requirements. It reviews the sequence and interaction of processes including the process inputs, outputs, controls and resources by ‘walking the process’.

Process Capability
Variable Data – For variable data, process capability is a measurable property of a process to the specification, expressed as a process capacity index (eg Cpk).

Attribute Data – For attribute data, the focus will be on calculating Defects Per Unit (DPU), Defects Per Million Opportunities (DPMO), and the process sigma level.

Process Capability Study
A study undertaken to statistically define the distribution of output from a process under normal operating conditions.

Process Characteristic
Process characteristics are process variables (input variables) that have a cause and effect relationship with the identified product characteristics. A process characteristic can only be measured at the time it occurs.

Process Control
Control of process characteristics used to ensure that a process is predictable and stable with an output that provides product or service characteristics that meet defined requirements.
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process Control Document (PCD)</td>
<td>A PCD is within AS/EN/9103. A PCD is a written description of a manufacturing plan developed to control variation in Key Characteristics. It is a living document and is updated to reflect the addition/deletion of Key Characteristics.</td>
</tr>
<tr>
<td>Process Failure Mode and Effects Analysis (PFMEA)</td>
<td>A Process Failure Mode and Effect Analysis (PFMEA) is a systematic group of activities intended to recognise and evaluate the potential failure of a process and the effects of that failure and to identify actions that could eliminate or reduce the chance of the potential failure occurring.</td>
</tr>
<tr>
<td>Process Flow Diagram</td>
<td>A graphical or symbolic representation of a process. Each step in the process is represented by a symbol with a short description of the process step. The symbols are linked by arrows to show the process flow direction.</td>
</tr>
<tr>
<td>Process Input Variable</td>
<td>Process input variables are process inputs that have a significant impact on the variation found in a key process output variable. That is, if the key process input variables were controlled, the process would produce predictable and consistent results.</td>
</tr>
<tr>
<td>Process Monitoring</td>
<td>Ensuring that process operation and performance are maintained against specification.</td>
</tr>
<tr>
<td>Process Output Variable</td>
<td>Process output variables are attributes or features of a product or manufacturing/production process parameter whose variation can affect fit, form, function, performance, service life, manufacturability, assembly or subsequent processing of the product.</td>
</tr>
<tr>
<td>Process Parameter</td>
<td>A measurable factor that determines the variation in a process.</td>
</tr>
<tr>
<td>Process Yield</td>
<td>Process yield is the number of products produced by a process (output) divided by the number of products going into that process (input) over a specified period of time. Only conforming products with no rework are counted as an output of an individual process.</td>
</tr>
<tr>
<td>Processor</td>
<td>A process supplier; it might be either an external supplier or an internal Rolls-Royce facility.</td>
</tr>
<tr>
<td>Product</td>
<td>The output of a process that can be delivered to a customer or to the next process. Products can be services, software, methods, hardware, documentation, advice and processed materials or a combination of these categories.</td>
</tr>
<tr>
<td>Product Audit</td>
<td>A product audit verifies that the product conforms to requirements.</td>
</tr>
<tr>
<td>Product Characteristic</td>
<td>Product characteristics are features or properties of a product, component or assembly that are described on the product definition.</td>
</tr>
<tr>
<td>Term</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Product Definition</td>
<td>Product Definition is the engineering drawing/specification which fully defines the product, part, component or assembly. It also includes physical or electronic drawings, electronic models or other associated information that defines the final product.</td>
</tr>
<tr>
<td>Product Introduction (PI)</td>
<td>Refers to the introduction of an existing product definition that is new to the supplier’s business and manufacturing/production facilities.</td>
</tr>
<tr>
<td>Product Verification</td>
<td>Product verification is the confirmation through the provision of objective evidence that the monitoring and measurement of product characteristics has verified that the product meets defined requirements.</td>
</tr>
<tr>
<td>Production</td>
<td>The processes and methods used to transform inputs into outputs using resources to provide a product or service.</td>
</tr>
<tr>
<td>Production Method</td>
<td>A set of documents (product definition, process and verification instructions and other technical material) required to produce a product that meets the product definition.</td>
</tr>
<tr>
<td>Production Permit</td>
<td>See ‘Deviation Permit’.</td>
</tr>
<tr>
<td>Production Product Approval (PPA file)</td>
<td>A Production Product Approval (PPA) file contains data related to the applicable Production Product Approval Process (PPAP) submission level for each product or product group.</td>
</tr>
<tr>
<td>Production Product Approval Checklist (PPAC)</td>
<td>Provides a formal record of specific’s relating to production product approval requirements for the product in scope, such as: change to the default submission, customer specific-requirements or agreed adaptations.</td>
</tr>
<tr>
<td>Production Product Approval Process (PPAP)</td>
<td>Production Product Approval Process (PPAP) is used to establish confidence in suppliers and their production processes, by demonstrating that all customer engineering design record and specification requirements are properly understood by the supplier and that the process has the potential to produce product consistently meeting these requirements during an actual production run at the quoted production rate.</td>
</tr>
<tr>
<td>Production Submission Warrant (PSW)</td>
<td>The Production Submission Warrant (PSW) closes out PPAP.</td>
</tr>
<tr>
<td>Production Run</td>
<td>The first group of one or more parts that are the result of a planned process designed to be used for the future production of these same parts. Prototype parts, or parts built using methods different from that intended for the normal production process, shall not be considered as part of the first production run.</td>
</tr>
<tr>
<td>Programme</td>
<td>A planned sequence of events or procedures related to a single project or several related projects.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>------------------------------</td>
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</tr>
<tr>
<td>Project</td>
<td>Planned set of interrelated tasks to be conducted over a fixed period within defined constraints (e.g., cost and other defined limitations).</td>
</tr>
<tr>
<td>Proprietary</td>
<td>An adjective that describes any item or process whose definition, design, and production is under the complete control and responsibility of the supplier, without reference to Rolls-Royce. Rolls-Royce has no rights to approve the design or design change of a proprietary item or process.</td>
</tr>
<tr>
<td>Purchase Order</td>
<td>A purchaser’s written contractual agreement with a supplier of goods or services that specifies information such as payment terms, delivery dates, item identification, quantities, shipping items, obligations and conditions.</td>
</tr>
<tr>
<td>Purchase Order Cascade</td>
<td>The purchase order information flow from a sub-tier supplier via the direct supplier and on to Rolls-Royce.</td>
</tr>
<tr>
<td>Purchaser</td>
<td>A person or organization placing an order or contract to buy a product.</td>
</tr>
<tr>
<td>Purchasing</td>
<td>The activity related to the buying, acquisition or procurement of materials, products or services, from a source that is external to the organization.</td>
</tr>
<tr>
<td>QASOR</td>
<td>Quality Assurance Statement of Requirement (QASOR) is a document that defines the quality assurance requirements for the supply process of a product by defining the certification that is to accompany the product delivery. Note, the title Statement of Quality Requirements (SOQR) that is used in some documentation is synonymous with QASOR.</td>
</tr>
<tr>
<td>Quality</td>
<td>The degree to which a set of characteristics fulfills requirements.</td>
</tr>
<tr>
<td>Quality Assurance</td>
<td>All the planned and systematic actions necessary to provide confidence that a structure, system or component will perform satisfactorily in service.</td>
</tr>
<tr>
<td>Quality Assurance Grade</td>
<td>Quality Assurance (QA) Grades are assigned to Equipment and Tooling based on their safety functional requirement or the potential consequences if they fail. QA grades 1-4 broadly correspond to high, medium, low and negligible consequences of failure respectively.</td>
</tr>
<tr>
<td>Quality Control</td>
<td>Those Quality Assurance actions that provide a means to monitor and measure the characteristics of an item to support product verification.</td>
</tr>
<tr>
<td>Quality Plan</td>
<td>A controlled document (generated by the supplier) which specifies processes, procedures and associated resources to be applied to a specific project. Usually generated as a project, product, or contract-specific document (see ISO10005).</td>
</tr>
<tr>
<td>Quality Representative</td>
<td>The company representative with technical responsibility for control of the process.</td>
</tr>
</tbody>
</table>
Raw Material  A material that will be used to create a product, but which has not been transformed by a production process into a product.

Raw Material Manufacturer  The source in the supply chain responsible for the original manufacture of the raw material product.

Reaction Plan  A reaction plan ensures that processes that cease to be in control and/or capable resume normal product verification/inspection until the cause has been identified, corrected and process capability and control are re-established.

Record  A document stating results achieved or providing evidence of activities performed.

Recordable Feature  A characteristic whose value shall be recorded and sent to Rolls-Royce for use in reliability and life calculations, e.g., a bearing end float.

Reduced Inspection  Reduced inspection is split into (two) 2 categories as follows:

Reduced Inspection of variables – the inspection of a sample of identical product characteristics taken from every product within a batch, from which the conformity of the remaining identical product characteristics within the batch is derived.

Reduced inspection of formed characteristics – the control method related to the inspection and control of a form tool and a sample of the product characteristic produced by the form tool which is used to verify the conformity of the remaining identical product characteristics of the entire batch.

Release Document  A formal serialised document that accompanies each delivery of a product. It indicates the release status of the product together with its compliance to the relevant purchase order, technical specifications and/or regulatory requirements. This is typically a Certificate of Conformance, TX0206, or TX0855.

Relevant Indication  An indication that is attributed to a flaw, defect or discontinuity.

Repair  Operations to reduce, but not necessarily eliminate, product non-conformance. The purpose of repair is to return non-conforming product to an acceptable condition, which may not completely conform to the original product definition, specification, or contract requirement.
Repeatability

Repeatability (Gauge R&R) is a measure of the ability of the system to give the same elements of the system, for example operator, environment, fixture etc.

A Repeatability study attempts to measure the variation in the measurement equipment only, when this is used to measure the same feature multiple times.

Reproducibility

Reproducibility (Gauge R&R) is a measure of how the different elements of a system affect variation. This may include: people, fixtures, location, time of day, light levels, temperature etc.

Reproducibility tries to establish whether any of the individual elements of the measurement system have any effect on the overall variation and, if so, how big this effect is.

Requirement

Something that is needed or wanted.

Re-substantiation

Analysis and testing required for evaluation of items produced by an alternative source at an alternative method of manufacture.

Reweld

When a weld area is completely removed back to the joint geometry without removing all of the weld metal and heat-affected zone, then the subsequent thermal cycle of the heat-affected zone is defined as a reweld. A reweld is also known as a 'heat cycle'.

Rework

Where a product has completed a production activity and is subsequently shown to be nonconforming, the corrective action taken on the nonconforming product to make it conform to the specified requirements using a sequence of defined/approved operations can be regarded as rework.

Right First Time

Right First Time (RFT) is a measure of how successful an organisation is at meeting requirements related to a product or product feature first time, without resulting in the need for rework, concessions or scrap. RFT also provides an organisation with the ability to detect process change and enable continual improvements within a data driven environment.

\[
RFT = \left(1 - \frac{\text{Number of nonconforming features}}{\text{Total number of features measured}}\right) \times 100\%
\]

Risk Assessment

The process of analysing and evaluating hazards; it involves both cause and consequence analysis requiring determination of probability and consequences.

Risk Management

See ISO 31000 for guidance.
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rolls-Royce Approved Supplier</td>
<td>A supplier holding a formal letter/certificate of approval issued by Rolls-Royce Power Engineering plc.</td>
</tr>
<tr>
<td>Rolls-Royce Global Specification</td>
<td>A document that describes technical requirements for materials, processes, designs or performance to support the component definition.</td>
</tr>
<tr>
<td>Rolls-Royce Standard Part</td>
<td>Parts similar to a national standard part whilst having specific attributes. The attributes include coating, size, material and space envelope.</td>
</tr>
<tr>
<td>Rough Machining</td>
<td>Removal of excess material from the product without achieving the final product dimensions.</td>
</tr>
<tr>
<td>Rounded Indication</td>
<td>See ‘circular indication’.</td>
</tr>
<tr>
<td>Safety Functional Requirement</td>
<td>The requirement that a system, structure or component shall meet to maintain the safety of a product.</td>
</tr>
<tr>
<td>Sample Inspection</td>
<td>Sample inspection is the inspection of a sample of products taken from a batch from which the product conformity of the entire batch is evaluated.</td>
</tr>
<tr>
<td>Scorecard</td>
<td>A scorecard is the means by which a supplier’s transactional performance such as quality, cost and delivery is captured and then measured by Rolls-Royce.</td>
</tr>
<tr>
<td>Seal Weld</td>
<td>A weld designed primarily to prevent fluid leakage.</td>
</tr>
<tr>
<td>Secondary Equipment</td>
<td>Equipment that is used in the secondary propulsion systems, eg Turbo Generators.</td>
</tr>
<tr>
<td>Secondary Packaging</td>
<td>A container for one or more primary-packaged products.</td>
</tr>
<tr>
<td>Sensitive</td>
<td>Sensitive parts are those whose primary failure are not hazardous but will have a significant effect on performance or reliability.</td>
</tr>
<tr>
<td>Serial Number</td>
<td>A formatted string of data that provides a means of identifying a specific individual item.</td>
</tr>
<tr>
<td>Serviceable</td>
<td>A product that is fit for purpose, capable and ready to perform its intended function (usually after being overhauled and/or repaired, and calibrated and tested).</td>
</tr>
<tr>
<td>Service Provider</td>
<td>An organisation or individual which provides intangible services rather than physical products (eg carries out processes such as maintenance).</td>
</tr>
<tr>
<td>Shall</td>
<td>The word ‘shall’ refers to a mandatory requirement.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>-----------------------------</td>
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</tr>
<tr>
<td>Shelf Life</td>
<td>A product in stock which has a defined timescale after which it becomes unusable (e.g., an expiry date) is said to have a shelf life.</td>
</tr>
<tr>
<td>Should</td>
<td>The word ‘should’ refers to a preferred approach on implementing a capability that is expected to be followed. For other approaches, it needs to be demonstrated that the approach meets the intent of the expectation.</td>
</tr>
<tr>
<td>Significant Indication</td>
<td>A relevant indication that exceeds a defined size and requires evaluation and disposition.</td>
</tr>
<tr>
<td>Small Bore Pipe or Tube</td>
<td>Any pipe or tube whose Nominal Pipe Size (NPS) is 80 mm or less.</td>
</tr>
<tr>
<td>Source</td>
<td>Any organisation providing products or services (including material) engaged in any or all of the manufacturing/production sequence of a part—including any assembly fitting processes and build inspection techniques.</td>
</tr>
<tr>
<td>Source change (control of work transfers)</td>
<td>See ‘control of work transfers’.</td>
</tr>
<tr>
<td>Source Demonstrated Repair</td>
<td>Source Demonstrated Repair is a source and method controlled repair which requires source capability demonstration, engineering approval of the supplier’s fixed process, and demonstration of their ability to perform the repair satisfactorily.</td>
</tr>
<tr>
<td>Source Inspection</td>
<td>Inspection that is performed by a Rolls-Royce representative at the manufacturing/production source of the supplied product.</td>
</tr>
<tr>
<td>Special-Cause Event</td>
<td>An abnormality that occurs during processing of the component and that can potentially cause a deleterious material effect; examples include process disruptions, equipment power loss, loss of coolant, tool breakage, tool digs, contamination and discolouration.</td>
</tr>
</tbody>
</table>
Special Process

Special processes are those processes, the results of which are highly dependent on the control of the process or the skill of the operators, and in which the specified quality cannot be readily determined by inspection or test of the product.

Special Processes include, but are not limited to the following.

a) Class A materials, melting method, conversion process.
b) Welding, hard facing, weld overlay cladding, weld build-up, brazing, bonding, and lead cladding.
c) Non-destructive Testing & Examination.
d) Non-conventional machining ie Electro Discharge Machining (EDM) or laser cutting of a final surface.
e) Artisan hand-dressing of final product.
f) Heat treatment and temperature related processes ie thermal treatment of metallic materials, welds, hard facing, weld overlay cladding and weld build-up including freezing and the heating and cooling cycles.
g) Chemical processing ie chemical treatment, preparation, and conditioning of surfaces, excluding processes used for destructive examination specimen preparation.
h) Coatings, ie application and removal of metallic and non-metallic surface protection coatings.
i) Castings, forgings, ie raw material manufacture using a casting or forging process.
j) Hot and cold forming and manipulation of materials.
k) Assembly and disassembly governed by the complexity of the equipment, to be agreed between Rolls-Royce and the Supplier.
l) Performance and environmental testing including prototype, proof and production testing.
m) Final degreasing and cleaning, packaging and labelling.
n) Curing.
o) Impregnation/Encapsulation.

SPOC

Rolls-Royce Single Point of Contact as detailed by the purchase orders.

Stable Process

A process operating in a state of statistical stability when all points lie within the control limits and fewer than eight consecutive points fall on either side of the mean of the measured value.

Standard Catalogue Hardware

Standard catalogue hardware is any item purchased from a catalogue available to the public or a part or material that conforms to an established industry or national authority published specification, having all characteristics identified by text description, national/military standard drawing or catalogue item.

Standard Manufacturing Inspection (SMI)

SMIs provide assurance through compliance with the empirical rules embodied within Section V of the ASME Boiler and Pressure Vessel (B&PV) Code, as modified by the appropriate section of ASME III (eg. NB, NC, ND, NF, NG), but are not subject to IQ. SMIs are embodied in the RRRs and RRRQs.
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Manufacturing Inspection Review</td>
<td>Is a review of all the SMIs applied to a given component or feature. The SMI Review assesses the likely performance of an inspection technique against a defect description defined in a datasheet. The assessment is based on expert review of the inspection capability and the objective is to demonstrate the full suite of inspections provides a level of capability that is likely to provide reliable detection.</td>
</tr>
<tr>
<td>Statistical Methods</td>
<td>Statistical methods include tools such as histograms, run charts, control charts, scatter diagrams, bar charts, rank order diagrams (Pareto), etc that can be applied (where practical) to monitor process performance.</td>
</tr>
<tr>
<td>Statistical Process Control (SPC)</td>
<td>Statistical Process Control (SPC) is the application of statistical methods to the monitoring and control of a process to ensure that it operates at its full potential to produce conforming product.</td>
</tr>
<tr>
<td>Stockist</td>
<td>A retailer or distributor of goods eg raw materials, products. Activities include the purchase, storage and sale of goods in a manner that conforms to requirements.</td>
</tr>
<tr>
<td>Structure</td>
<td>A structure is a passive element, building, vessel or shielding.</td>
</tr>
<tr>
<td>Submission Level</td>
<td>The submission level identifies the information to be submitted to the customer during the Production Product Approval Process (PPAP).</td>
</tr>
<tr>
<td>Substantiation</td>
<td>Confirmation that a control plan reliably produces results that comply with the product definition.</td>
</tr>
<tr>
<td>Sub-tier Supplier</td>
<td>A supplier not working under a purchase order from Rolls-Royce but performing work on a Rolls-Royce product at a lower level in the supply chain.</td>
</tr>
<tr>
<td>1st Tier Supplier</td>
<td>A supplier working under a direct purchase order from Rolls-Royce.</td>
</tr>
<tr>
<td>Supplier</td>
<td>An organization providing a product or service that is linked to the purchaser by a purchase order.</td>
</tr>
<tr>
<td>Supplier PPAP Coordinator</td>
<td>A responsible person identified by the supplier’s organisation to be responsible (solely or as part of their role responsibilities) for ensuring that all necessary activities are identified, implemented and monitored to satisfy the Production Product Approval Process (PPAP).</td>
</tr>
<tr>
<td>Supplier Quality Management System</td>
<td>A SQMSR document is used to flow down the supplier’s (purchaser’s) and the supplier’s customer’s quality management system requirements and expectations to all sub-tier/subcontract suppliers or partners who provide a product or service.</td>
</tr>
<tr>
<td>Requirements (SQMSR) document</td>
<td></td>
</tr>
<tr>
<td>Surface Defect</td>
<td>Flaws and mismatches, not features considered during inspection of surface texture.</td>
</tr>
</tbody>
</table>
Surface Treatment: A process that changes the material properties of a given surface, such as shot peening, case hardening and etching.

Technical Query (TQ): A method for a supplier to raise an issue with, or request clarification of, a product definition to Rolls-Royce.

Tertiary Packaging: The outermost level of packaging.

Third Party Certification: An independent assessment declaring compliance to requirements pertaining to a product, person, process or management system.

Top Management: Person or group of people who directs and controls an organisation at the highest level.

Traceability: The ability to retrieve information about an event or events that have occurred during the manufacture of a particular item.

TS16949: TS16949 is a technical specification (based on the ISO 9001) quality management systems for automotive production and relevant service part organisations.

Tube: A long hollow cylinder within a heat exchanger or other vessel.

Tubesheet: The end wall of a shell-and-tube heat exchanger into which tubes are located and supported. The tubesheet also separates the primary and secondary sides of the heat exchanger.

Turbidity: The cloudiness or haziness of a fluid caused by large numbers of individual particles that are generally invisible to the naked eye, similar to smoke in air. Turbidity is a visual indicator of water quality.

TX0206: The TX0206 is the Material Acceptance and release form. This is the default assurance document, which, when duly signed by Rolls-Royce, constitutes the Rolls-Royce C of C that the product supplied meets the Rolls-Royce purchase order. The requirement for a TX0206 is mandatory for delivery to the external customer for a submarine application. The purchase order will state the TX0206 release certification based on customer, and end use/user requirements.

TX0855: The TX0855 is an Intermediate Acceptance Form and it shall be used as indicated in the Rolls-Royce purchase order. The purchase order will state the TX0855 release certification based on customer, and end use/user requirements.
Unaided Eye
Using natural or corrected vision of an operator or inspector without the use of magnifiers, bore-scopes, fibre-scopes or other mechanical visual aid apparatus.

Unclassified
Unclassified products/parts with no classification and are neither designated critical nor sensitive i.e. Where a part is unclassified there is no legend on the product definition therefore this non-classification is termed Unclassified.

Unserviceable Product
A product that is not suitable for re-use but may be capable of restoration for further use via an approved repair technique.

Validation
Activities performed to demonstrate that a product is capable of meeting the requirements for the specified application or intended use; this may include certification activities as/where applicable.

Variation
The change in the output or result of a system (process).

Variation management product
Variation management is performed to drive the improvement of production processes through adequate planning and effective management of Key Characteristics (KPC) and Conformance Control Feature (CCF) variation – see also AS/EN/SJAC 9103 – variation management of key characteristics.

Verification
Confirmation through the provision of objective evidence that requirements have been fulfilled.

Visual Acuity
Visual acuity is acuteness or sharpness of vision which can be determined by an ability to define certain letters and can be tested for both distance and near vision.

a) Distance – 6/9 in at least one eye
b) Near – N5 (Curpax) or J2 (Jaeger) or equivalent in at least one eye

Weld
Localized coalescence of metals or non-metals produced either by heating the materials to the welding temperature, with or without the application of pressure, or by the application of pressure alone and with or without the use of filler material.

a) Manual welding – the welding procedure is controlled completely by a welder.
b) Mechanised welding – the welding operator monitors and adjusts the weld process (within the limits of the welding procedure).
c) Semi-automatic welding – Gas Metal Arc Welding and flux-cored arc welding with a hand-held torch (generally a North American term).
d) Automatic welding – no external (human) input is required during welding.

Weld Restart
The controlled sequence of carrying out a weld start, subsequent to a weld stop, such that the resultant weld at the tie-in region is suitably equivalent to that of a continuous pool.
Weld Start  The controlled sequence of initiating a welding arc and additional process operations in order to commence a weld.

Weld Stop  The controlled sequence of discontinuing a welding arc and additional process operations in order to terminate an in-process weld. This might also result in a stop-onto-start feature.

Welder  One who performs manual or semi-automatic welding.

Welding Equipment  All the components that support the following functions, as appropriate:
   a) Locate, support or align the welding head relative to the weld joint.
   b) Produce and maintain a heating or cooling source.
   c) Manipulate the heat source within the joint.
   d) Produce and govern the relative motion between the heat source and the component.
   e) Control the shield gas.
   f) Control the rate of feed of filler metal.
   g) Provide the source of electrical power.
   h) Control the welding cycle.

Welding Operator  One who operates mechanised or automatic welding equipment.

Will  The word 'will' refers to an intention in connection with a requirement.

Witness (by the customer)  An event that allows the right of access for Rolls-Royce representatives, their customer and regulatory authorities to perform an assessment, inspection, surveillance or other investigative activities at the supplier’s manufacturing/production facility (including any level of the supply chain involved in the purchase order/contract).

Work Instruction  A documented procedure that describes the method, parameters and equipment to be used for processes.

Wrought  A worked, shaped or formed ingot.
4 TYPES OF SPECIFICATION:

4.1 RRDS – Rolls-Royce Design Standard:
An internal-facing document detailing design guidance, design best practice, materials selection, the calculation of mechanical properties etc for consideration when designing particular components, features or specifying particular processes. The design standard is not specified on component definitions.

4.2 RRES – Rolls-Royce Engineering Standard:
An external-facing document specifying generic requirements that can be used universally, ie not component-specific. A supplier does not require approval to comply with the requirements of a RRES but if a particular RRES requires the application of a special process, then the supplier shall be approved to that process. RRESs are specified on component definitions.

4.3 RRMS – Rolls-Royce Materials Specification:
An external-facing document specifying the composition, method of manufacture, delivery heat treatment condition, minimum material release properties and materials quality requirements for a material. Material specifications are specified on component definitions.

4.4 RRP – Rolls-Royce Process Specification:
An external-facing document specifying how to operate a process consistently. It lists the essential variables for control, consumables, maintenance, substantiation and monitoring. The detailed parameters are contained within the work instruction. Most processes are ‘special processes’ and shall be controlled accordingly. RRPs are specified on component definitions or mandated via another specification such as an Engineering Standard or a Quality Standard.

4.5 RRQ – Rolls-Royce Quality Standard:
An external-facing document that might apply to a family of components or be component-specific. RRQs cover component or material quality only, for example the surface defect standard or subsurface defect standard, and are used by an inspection area. RRQs are specified on component definitions and they might also refer to RRPs for non-destructive testing process specifications.
### NOTES:

5.1 Revision bars indicate changes from the previous version of this specification and are located in the left margin.

5.2 Change History:

<table>
<thead>
<tr>
<th>VERSION</th>
<th>DATE</th>
<th>CHANGE SUMMARY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>April 2014</td>
<td>Initial issue.</td>
</tr>
</tbody>
</table>
| 2.0     | Feb 2015  | • Expanded the definition for the Conformance Control Features  
               • Corrected the conductivity specification for ultra-pure demineralised water from <1 μS/cm to <0.1 μS/cm  
               • Mains water renamed industrial water  
               • Expanded the definition for material groups  
               • Added terms relating to Non-Destructive Examination  
               • Added terms relating to welds  
               • Changed other terms for simplification, duplication or clarity |
| 3.0     | Jun 2015  | Addition of the definition of COTS                                                                                                           |
| 4.0     | July 2016 | Clarification of Finishing Operations to align with the requirements for fixed process within RRES 92000                                     |
| 5.0     | Dec 2016  | Addition/harmonisation of definitions from GS3001 definitions document.  
               Adding/fitness for purpose of definitions from GS3001 definitions document.  
               Editorial corrections and clarification. |
| 6.0     | Dec 2016  | Clarification and addition of definitions for:  
               Key Product Characteristics  
               Quality Assurance Grades  
               Service Provider                                                                 |
| 7.0     | Jan 2017  | Insertion of definitions for:  
               • Capability Statement  
               • Data Acquisition Engineer (DAE)  
               • Data Interpretation Engineer (DIE)  
               • Enhanced Manufacturing Inspection (EMI)  
               • Inspection Qualification (IQ)  
               • Manufacturing Acceptance Inspection (MAI)  
               • Non-Destructive Testing Datasheet  
               • Personal Certificate in Non Destructive Testing (PCN)  
               • Performance Based Non-Destructive Testing (NDT)  
               • Standard Manufacturing Inspection (SMI)  
               • SMI Review  
               Addition of statement in para 5.1 |

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EDNS9700568103
Version: 7.0 (Approved)