The Design & Development process in the Design Sub Contract supply chain

Issue 4 - April 2017
RR DOA: Supplier Design & Development Requirements ‘Flow-Down’

Customer/Regulatory Requirements

RR DOA Exposition
EASA 21 (J)

SABRe B2.1
For product design/dev activities, the supplier shall comply with the requirements of RRES90009

RRES90009
Requirements for Design & Dev
The applicability of these requirements to the suppliers products/programmes will be defined by RR and shall be agreed with the supplier through their compliance matrix included within their DDQP/ESID

ESID
Engineering Supplier Integration Document

Supplier Design Surveillance

GP ES 0
Source Strategically and Manage External Suppliers

LP ES 0-3
Manage Supplier Approval

GP QI 3.1
Supplier Assessment

RRW
Supplier Approval codes/Approval Certificate

GP EP Series
Design Definition
(WI EP 0-1 for design only or design/make suppliers)

RRMS process

RRMS process
• Engineering design work (including test and analysis) may be undertaken by external organisations under the control of the Rolls-Royce Deutschland DOA. The global Rolls-Royce Specification **RRES 90009** (Requirements for Design and Development Activities) contains the set of requirements applicable to the management of RRD Design Supplier and to any inter-company trading within the Rolls-Royce community.

• External organisations carrying out such work require approval by Rolls-Royce consistent with the type of work and the organisation concerned. VA.SB.0100 (Quality Assurance System Requirements for Suppliers to Rolls-Royce Deutschland Ltd & Co KG), VA.SB.0060 (Approval and Authorization of Supply Sources), VA.SB.0206 (Procurement of Investments, Services and Non-aeronautical Items), GP SB 2 (Create Integrated Commodity Strategies) and GP SB 5 (Maintain Supplier) provide the procedural and control requirements for this. **SABRe** (Supplier Advanced Business Relationship) is the controlling Quality System for all Rolls-Royce suppliers. **SABRe** is issued to all suppliers. It describes the Rolls-Royce Deutschland requirements and processes and is a mandatory requirement placed on all suppliers.
DOA Exposition

Extract from Rolls-Royce UK MISC3309 EASA Design organisation exposition Item 13

• Engineering design work (including test and analysis) may be undertaken by external organisations under the control of the Rolls-Royce plc DOA.

• External organisations carrying out such work require approval by Rolls-Royce consistent with the type of work and the organisation concerned. GP ES 0 (Source Strategically and Manage External Suppliers) provides the procedural and control requirements for this. The Rolls-Royce Supplier Management System, known as SABRe, is the controlling Quality System for all Rolls-Royce suppliers. SABRe is located within the RRMS and is also provided to all suppliers. It describes the Rolls-Royce plc requirements and processes and is a mandatory requirement placed on all suppliers.
Design/Make or Design/Development Suppliers

RRMS process - WI EP 0-1 (Manage design only or design and make suppliers)

Design only or design and make suppliers shall have procedures that meet the requirements of RRES 90009 Requirements for Design and Development Activities and shall operate their procedures to meet the rules of GP EP 0. Design only or design and make suppliers shall be managed according WI EP 0-1.

• Purpose
  - This Work Instruction defines the operation of Engineer Products procedures using Design only or design and make suppliers within the team. A Design only or design and make supplier is one where reliance is put upon their specialist engineering knowledge or competence to develop product definition data or supply design or development (that is verification by physical testing) tasks specifically for a Rolls-Royce application.

• Applicability
  - This global Work Instruction is applicable to GP EP 0 and its sub-procedures and is applicable at product, system or component level. The term Design only or design and make suppliers includes suppliers producing designs specifically for a Rolls-Royce application, risk and revenue sharing partners, joint ventures and other Rolls-Royce companies (legal entities).
Source Strategically and Manage External Suppliers

RRMS process – GP ES 0 (Source Strategically and Manage External Suppliers)

The purpose of this process is to set the principles and key steps by which Rolls-Royce sources from and manage external suppliers, and the principles for managing external supplier relationships.

- **LP ES 0-3 - Manage Supplier Approvals**
  This LP prescribes the methods to be used for managing supplier approvals.

- **Supplier Approval Process Manager**
  This document provides instructions for the application of LP ES 0-3 (A,N) – Manage Supplier Approval for employees working in the Aerospace and Infrastructure & Services areas of Rolls-Royce. It must be used in conjunction with GP QI 3.1 Manage Internal & Supplier Audit where audit activity of the supplier is being conducted.
Getting started – SABRe/RRES 90009
(supplier access)
Getting started – SABRe/RRES 90009

Standards and specifications

A secure repository of standards and specifications Rolls-Royce requires of its supply chain in order to fulfill purchase or contract orders.

Welcome to the global standards and specifications
This website is a repository of Rolls-Royce standards and specifications required by its supply-chain network to fulfill particular purchase or contract orders placed by the company.

These standards and specifications are available to approved Rolls-Royce suppliers worldwide, 24 hours per day, 7 days per week.

The documents are held in a secure web-enabled system, to protect the Intellectual Property Rights of Rolls-Royce plc data and its product information.

Manufacturing laboratories catalogue
The information listed in the file below details the approved metallic material, casting and forging Suppliers plus a global consumables catalogue.

The availability of these documents enables suppliers to directly access specifications information without the need to access Rolls-Royce specifications that are password protected.

Export control
Please note, due to export control and government regulations, separate authorisation is required to access each set of specifications.
1 Purpose
SABRe Supplier Management System Requirements is the supplier-facing element of the Rolls-Royce Management System.

The purpose of SABRe Supplier Management System Requirements is to formally communicate Rolls-Royce requirements and expectations to the global supply chain and is available to view and download from the Rolls-Royce Global Supplier Portal (GSP) https://suppliers.rolls-royce.com

2 Contents, scope and applicability
SABRe Supplier Management System Requirements comprises three (3) chapters and is applicable to all suppliers or partners who supply product related to Rolls-Royce contracts / purchase orders as follows:

Chapter A - General Requirements
Is modeled upon the structure of ISO9001 (cause titles 4 to 8) and shows the additional general requirements and expectations of Rolls-Royce.

Chapter B - Product and Production Process Requirements
Has commonality with AAI’s APQP (Advanced Product Quality Planning and Control Plan) but differences exist given the distinctive requirements of Rolls-Royce.

Chapter C - Production Product Approval Process
Enables a supplier to obtain production product approval from the customer.

3 Definitions
Refer to SABRe definitions for additional information. This document is available to view and download from the Rolls-Royce Global Supplier Portal (GSP) https://suppliers.rolls-royce.com

4 Forms and form templates
Forms and form templates are available to view and download from the Rolls-Royce Global Supplier Portal (GSP) https://suppliers.rolls-royce.com.

B2 Product design and development

B2.1 Product design and development
Product design & development requirements are applicable to:

- Suppliers authorised by Rolls-Royce to create design definitions, using their own design rules and standards within the constraints defined in this document and / or the Rolls-Royce contract / purchase order.

The supplier shall:
Comply with the requirements of RRS: 90009 - Requirements for design & development activities.

B2.2 Control of design changes

- Design Control is applicable to:
  - Design changes that affect the fit, form or function of existing designs i.e. design changes following a configuration freeze, which do not fulfil the criteria for a Definition Alteration Request (see A.4). The supplier shall:
    - Ensure design changes are authorised by their Rolls-Royce technical authority before implementation (including verification and validation as appropriate).
    - Complete and submit the form(s) associated with this activity to their Rolls-Royce technical authority (see forms below) with all applicable information at each stage of implementation.
    - Ensure that configuration management related to design changes controlled.
    - Maintain records of design changes as category X (see A.1.4).

FORMS (see section 4 on page 2)

B3 Production design and development

B3.1 Process flow diagram
The supplier shall:
Develop and document the production process flow, from the beginning of the process up to the delivery of the product, that includes (but is not limited to) the following:

- Process operational sequence related to the production of product
- Processes requiring a qualified operator
- Identification of external (purchasing / subcontract) activities
- Where in the process product verification is performed (see B.2.1)
- Where in the process performance metrics are recorded (see B.2.2)
- Configuration management

NOTE: A single process flow diagram may apply to a group or family of products that are produced by the same process at the same location.
Scope.

- The Design and Development process applies to suppliers authorised by Rolls-Royce to create design definitions, using their own design rules and standards.

- Design definitions may range from simple mechanical components to software and complex electronic or mechanical assemblies.

- Note that Design Definitions are complete and detailed descriptions of a product including its functional characteristics, supply chain, cost - as well as how to make, operate, maintain, support it in service and disposal.
The Design & Development Process.

- The process covers the requirements of Rolls-Royce design processes in the following areas:
  - Organisation and Resource management
  - Programme Management
  - Design
  - Design Verification
  - Validation
The Design & Development Process

- Rolls-Royce shall initiate work with the supplier to develop a product concept.
- Rolls-Royce will define any contract specific process requirements.
- Rolls-Royce will indicate on a compliance matrix the RRES 90009 requirements applicable to the supplier’s products/programmes.
- The supplier shall assess their Quality Management System against the applicable requirements, and make any necessary updates.
As a result of service and product development experience, Rolls-Royce recognises that rigorous and meticulous control over all activities and organisations contributing to the product design are essential in reducing risks to product integrity, reliability, quality and business continuity.

Rolls-Royce requires that the design practices owned by a supplier, (including control of sub-tier suppliers), are at least equivalent to its own.
Rolls-Royce Requirements for Design & Development Activities.

• Design and Development Suppliers shall ensure that they and their supply chain comply with the following requirements:
  - Rolls-Royce Engineering Standard in RRES 90009, RRES 90014 and RRES 90052 (as applicable).
  - Technical Requirements - The Product requirements produced by Rolls-Royce through engagement with Rolls-Royce Customers and the Supplier.
  - Any additional contract specific process requirements.
Technical Requirements

• The supplier shall agree with Rolls-Royce the technical requirements (*Product requirements produced by Rolls-Royce through engagement with Rolls-Royce and the supplier*)

• Top level requirements from Rolls-Royce are expressed in a Project Requirement Document or Business Requirements Document which is used to help develop the technical requirements.

• The technical requirements may be expressed by a single Technical Requirements Document (e.g. Component Requirements Document, Envelope Drawing, Request for Proposal, Standards Document or any combination of these)
Technical Requirements

Technical requirements will include (but are not limited to):
• Functional and performance requirements
• Reliability, integrity and life requirements
• Environmental requirements (space, thermal, vibration, etc.)
• Applicable statutory and regulatory requirements
• Applicable Rolls-Royce design policies (e.g. safety)
Contract Specific Requirements

• The supplier shall agree with Rolls-Royce any additional contract specific process requirements and shall ensure that these requirements are detailed in the supplier’s contract with Rolls-Royce.
The ESID

- The Supplier shall produce and agree with Rolls-Royce an ESID including the completed, Compliance Matrix.

- The supplier shall agree with Rolls-Royce the applicability of each RRES 90009, 90014 & 90052 requirement to the products/programmes of a supplier through the development of the Compliance Matrix included within the ESID.

- The ESID (including the Compliance Matrix) must:
  - Demonstrate that the Supplier’s design practices give a satisfactory means of compliance to RRES 90009, RRES 90014 and RRES 90052 (as applicable).
  - Demonstrate means of compliance to any additional requirements.
  - Describe interfaces, communications and limits authority between the supplier and Rolls-Royce.
ESID - Update.

- The ESID must be updated as a result of:
  - New or evolving requirements
  - Supplier Quality System improvements
  - Additional scope or new business

- The ESID should cover as many Rolls-Royce global projects / applications as possible.

- Encourage process commonality across a Supplier’s Rolls-Royce projects / programmes, minimising differences
The Design & Development Process.

• The Supplier shall operate as defined within the ESID.

• The Supplier shall adhere to Rolls-Royce’s Component Technical Review Process through satisfaction of the Technical Review Requirements in RRES 90009, RRES 90014 and RRES 90052 (as applicable).

• The Supplier shall ensure the ESID remains up-to-date and compliant.

• Rolls-Royce will perform regular surveillance activities to verify the Suppliers compliance to the ESID and assess changing supplier capability.
The relationships between the management controls (Requirements, ESID, Compliance Matrix etc), within the scope of the design and development process, are detailed in the relationship diagram.
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