



Rolls-Royce

SABRe (Edition 2)

Supplier Requirements

Overview

(last amended 19 June 2012)

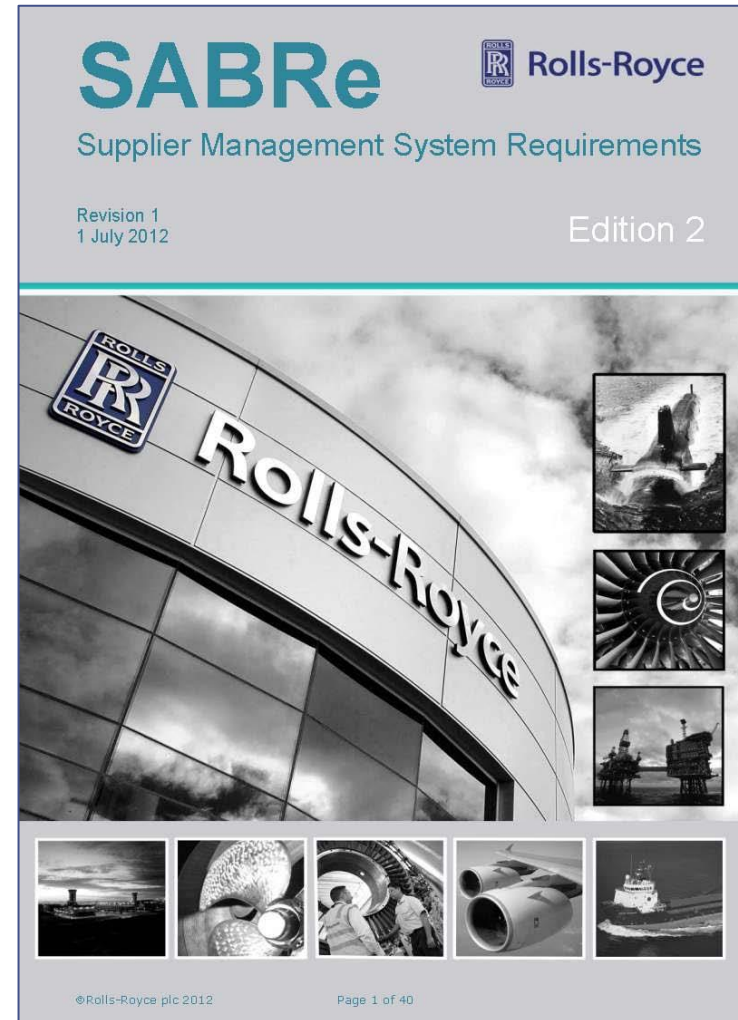
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SABRe Supplier Management System Requirements

- SABRe Supplier Management System Requirements is the supplier facing element of the Rolls-Royce Quality Management System.
- The purpose of SABRe is to formally communicate Rolls-Royce requirements and expectations to the global supply chain.
- SABRe is available to view and download from the Rolls-Royce Global Supplier Portal (GSP)
<https://suppliers.rolls-royce.com>
- SABRe Supplier Management System Requirements supersedes all SABRe process documents shown on the GSP prior to July 2012



SABRe Chapters

SABRe comprises of three (3) chapters:

- **Chapter A - General Requirements**
- **Chapter B - Product and Production Process Requirements**
- **Chapter C - Production Product Approval Process (PPAP)**

The supplier shall:

- Comply with chapters A and B when current production activities have been established and a product has been produced and shipped with an approved FAIR.
- Comply with chapters A, B and C for NPI and PI

New Product Introduction (NPI)

Product Introduction (PI)

SABRe Chapters A,B and C

Chapter A - General Requirements:

- Is modelled upon the structure of ISO9001 (clause 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 AIAG's Advanced Product Quality Planning and Control Plan but differences exist given the distinctive requirements of Rolls-Royce
- Embodies the concepts of error prevention and continual improvement as contrasted with error detection

Chapter C - Production Product Approval Process:

- Enables a supplier to obtain production product approval from the customer
- Has commonality with AIAG's PPAP (Production Part Approval Process) but differences exist given the distinctive requirements of Rolls-Royce

SABRe Chapter A

SABRe Chapter A


A1.1 QMS certification and approval

- *ISO9001 is required for all non-aerospace contracts*
- *AS9xxx certification is required for aerospace contracts*
- *Inspection and testing – ISO/IEC17025 or AC7004*
- *Testing and calibration laboratories - ISO/IEC17025*
- *Special Processors - Nadcap / NUCAP*

*AS9xxx refers to:
AS/EN/JISQ 9100, 9110 and 9120 as applicable*

Chapter A

SABRe Supplier Management System Requirements



A3.3 Vision standards

♦ *Applicable to personnel conducting product verification / inspection that requires visual acuity.*

The supplier shall:

- Perform a vision assessment (eye examination) on commencement of employment and at two (2) yearly intervals for personnel engaged in product verification / inspection activities to ensure visual acuity
- Ensure that the vision assessment (optometric examination) is performed by a trained / qualified person
- Ensure that optical aids used during the vision assessment to ensure visual acuity are also used during product verification / inspection activities
- Perform a (one time only) colour perception test to ensure that personnel are capable of distinguishing and differentiating colours where colour perception is required for product verification / inspection activities
- Maintain records of vision standards as specified for product verification ([see B4.1](#)).

A3.4 Business continuity and risk management

The supplier shall:

- Establish business continuity plans that identify, analyse, evaluate and / or mitigate risks related to business continuity that includes (but is not limited to) the following:
 - Product, facility or individual skill uniqueness
 - Access to alternative production facilities
 - Single points of failure (including sub-tier suppliers) or key processes
 - Remote backup of computer data
 - Access to alternative information technology systems
 - Action plans and timescales for business recovery
 - Contacts, process owners and procedures to follow in the event of an emergency
 - A strategy to control, review periodically and communicate plans to all relevant personnel
- Perform a business risk assessment, the output of which will be used as part of the business continuity plan, that includes (but is not limited to) the following:
 - Risk identification - identify sources of risk, their cause and effects and their potential business impact
 - Risk analysis - consider the likelihood and level of impact of the identified risks
 - Risk evaluation - compare the level of risk found during the analysis process and prioritise risks treatment
 - Risk treatment - prepare contingency and / or mitigation plans to reduce risk levels
 - Monitor and review the risk management activities to ensure controls are effective
- Inform their Rolls-Royce purchasing contact immediately regarding the following:
 - Changes to third party or other party certification including lapse / withdrawal / major audit findings
 - Change of the nominated quality representative
 - Significant change to the quality management system
 - Change in ownership or discontinuation of business activities
 - Risks that could impact upon the continuity of the supplier's business / operations
 - Risks with the supply of substances used in the production or physical make-up of products, due to laws and regulations concerning the control or use of such substances that may be published from time-to-time
- Ensure that chemical substances constituting or contained in products supplied to Rolls-Royce are not restricted under Annex XVII of REACH (Registration, Evaluation and Authorisation of Chemicals)
- Ensure that data related to the use of substances and mixtures that has been provided to the supplier by Rolls-Royce is passed onto sub-tier / subcontract suppliers (when applicable)
- Submit risk register and contingency plans to Rolls-Royce on request
- Maintain records of risk management as category 'B' ([see A1.4](#)).

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Document Revision 1

SABRe Chapter A

A1.1 QMS certification and approval

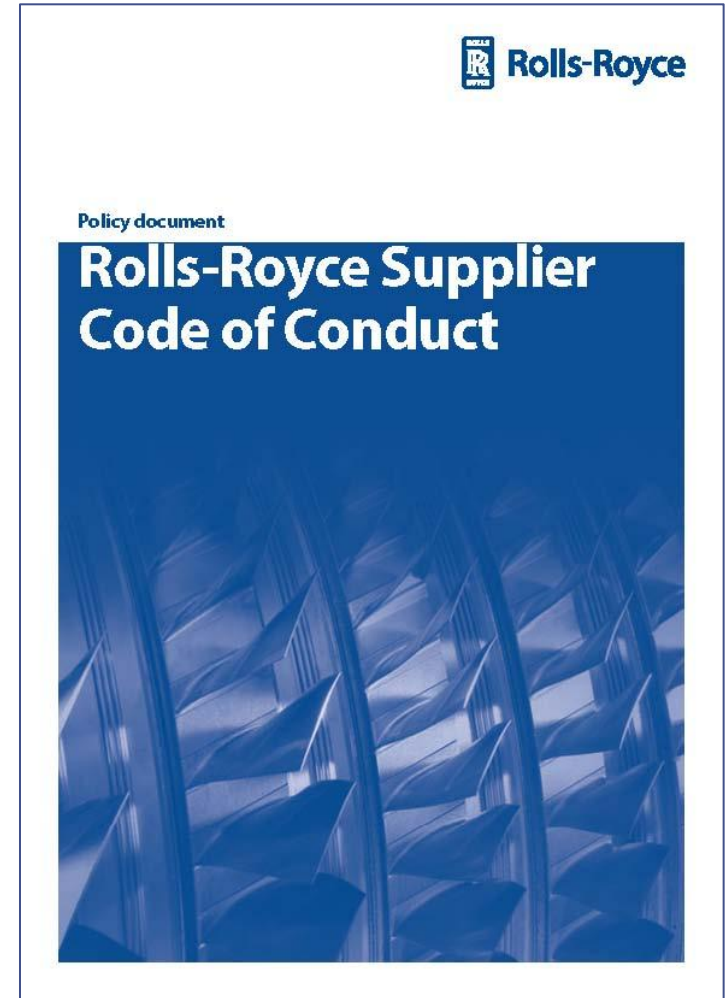
- *Hold a Rolls-Royce approval...*
- *Work within the scope of approval...*
 - *as communicated by the relevant Rolls-Royce sector / regional business unit.*



SABRe Chapter A

A1.2 Supplier code of conduct

- *Demonstrate compliance with:*
 - *The minimum standard of business behaviours and practices*
 - *Applicable laws and regulations*
 - *Act in a way that is ethical and corporately responsible*



SABRe Chapter A

A1.3 Control of Rolls-Royce documents

- *Comply with the current revision of documents / specifications*
- *Flow down Rolls-Royce documents / specifications to sub-tier suppliers*
- *Translation of Rolls-Royce documents is performed by a competent translation service.*



SABRe Chapter A

A1.4 Control of Rolls-Royce records

- *Records retrievable within 24 hours*
- *Records requiring authorisation by Rolls-Royce will be written in the English language (or dual language)*
- *Records will be retained as two (2) categories*
 - *Category A – Permanently*
 - *Category B – six (6) years*



Each section of SABRe identifies where a record is required to be maintained and specifies category A or B.

SABRe Chapter A

A2.1 Management commitment

- *Quality policy,*
- *quality objectives,*
- *quality planning*
- *and quality management reviews*
- *Match the potential effects of the supplier's product on the Rolls-Royce product into which they are incorporated (see A4.1)*



SABRe Chapter A

A2.2 Responsibility, authority and communication

- *Personnel responsible for product quality (across all production shifts) and ensure that they have the following:*
 - *Authority to stop production to correct quality problems*
 - *Organisational freedom and unrestricted access to top management to resolve quality issues*
- *Establish a procedure for task and shift handovers...*
 - *Necessary information is communicated (verbally and in written form) between the out-going and in-coming personnel.*



SABRe Chapter A

A3.1 Training and competence

- *Establish a documented procedure for identifying training needs, achievement and review of competence of all personnel performing work...*
 - *Create role profiles / accountabilities*
 - *On-the-job training*
 - *Business skills matrix*

Trained

Competent

SABRe Chapter A

A3.2 Cleanliness of workplace

- *Maintain its workplace in a state of order, cleanliness and repair consistent with the product and production process needs:*
 - *Tools such as 5S (Five-S) and visual management should be used for workplace organisation improvement.*



SABRe Chapter A

A3.3 Vision standards

- *Perform a vision assessment (eye examination) ...*
 - *For personnel engaged in product verification / inspection activities*
 - *Vision assessment (optometric examination) is performed by a trained / qualified person*
 - *Perform a (one time only) colour perception test*



SABRe Chapter A

A3.4 Business continuity and risk management

- *Establish business continuity plans that identify, analyse, evaluate and / or mitigate risks related to:*
 - *Product, facility or individual skill uniqueness*
 - *Access to alternative production facilities*
 - *Single points of failure*
 - *Access to alternative information technology systems*
 - *Action plans and timescales for business recovery*
 - *Contacts in the event of an emergency*



SABRe Chapter A

A4.1 Critical items and assurance of product integrity

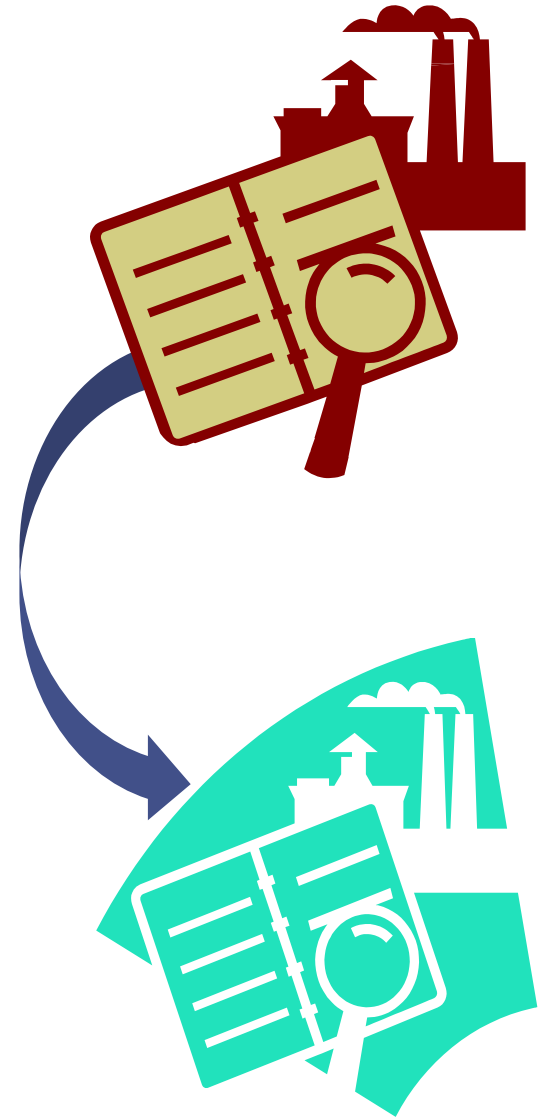
- *Ensure personnel are aware of critical items and the potential consequences of delivering product that does not conform to requirements.*
- *Specify critical items during...*
 - *purchasing / subcontracting (see A4.3),*
 - *product design and development (see B2),*
 - *production design and development (see B3)*
 - *Include key characteristics and specific actions to be taken for these items.*



SABRe Chapter A

A4.2 Control of work transfers (source change)

- *Establish a documented procedure for the control of work transfers (source change)...*
- *Plan, control and verify the conformity to specified requirements during the temporary or permanent transfer of work*
- *Submit to Rolls-Royce*
- *Proceed when a response has been received from Rolls-Royce*
- *Ensure delivery performance is protected*



SABRe Chapter A

A4.3 Purchasing / subcontracting

- *Only purchase from...*
 - *A source holding appropriate certification*
 - *A Rolls-Royce approved source, unless the supplier (purchaser) is approved / authorised by Rolls-Royce to control subcontractors / sub-tier suppliers"*
- OR
- *Purchasing activities, materials, products or services specified in SABRe*
- *Purchasing information / documentation communicates (flows down) the supplier's requirements and Rolls-Royce requirements*

SABRe Chapter A

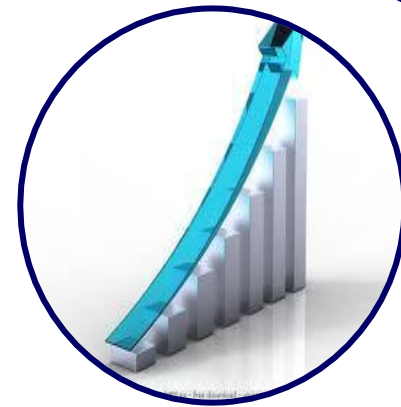
A4.4 Receipt inspection / verification of purchased product

- *Verify that the purchased product meets requirements*
- *Ensure that supporting documentation has been provided that states that the product meets specified purchase requirements.*



A4.5 Subcontractor / sub-tier supplier monitoring

- *Monitor subcontractor / sub-tier supplier performance...*
 - *Delivered product quality*
 - *Customer disruptions / customer returns*
 - *Delivery schedule performance*



SABRe Chapter A

A4.6 Visual management

- *Establish a visual management process that will provide feedback to everyone involved in the process...*
 - *Current status*
 - *Flow of work*
 - *Priority and the performance of the process*
 - *Understood at a glance, so everyone can see what is under control (and what isn't).*



SABRe Chapter A

A4.7 Preventive and predictive maintenance

- *Identify key process equipment*
- *provide resources for machine / equipment maintenance*
- *develop an effective planned total preventive maintenance system that includes...*
 - *Planned maintenance activities*
 - *Availability of replacement parts*
 - *Maintenance objectives*
 - *Safety-critical plant and equipment*



SABRe Chapter A

A4.8 Foreign Object Debris (FOD)

- *Establish a process to detect and prevent Foreign Object Debris...*
 - *FOD process review*
 - *Training of FOD practices*
 - *Material handling and product protection*
 - *Tool / hardware accountability*
 - *Lost items search and documentation process*
 - *Physical entry control into FOD critical areas*
 - *Inspection for foreign objects prior to closing apertures and compartments during assembly*



SABRe Chapter A

A4.9 Delivery transport

- *Use the Rolls-Royce standard delivery transport network and collection service as / when specified by Rolls-Royce*
 - *Manifest or equivalent*
- *When the Rolls-Royce standard transport network and collection service is not specified or will not / cannot be used...*
 - *Use appropriate transport to ensure that the product is delivered in a timely manner and ensures that the product will be received in a condition that is fit for purpose*



SABRe Chapter A

A4.10 Storage and inventory

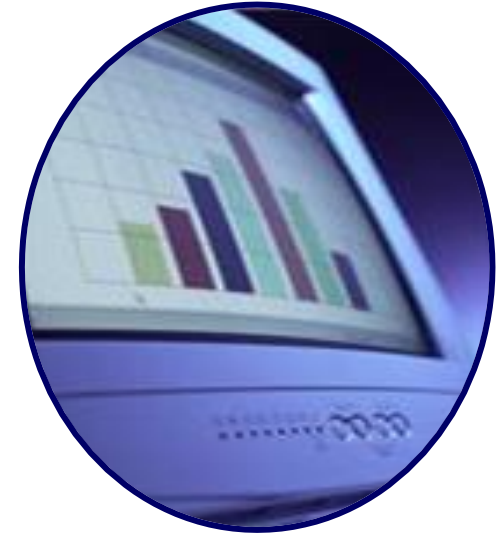
- *Provide secure storage facilities*
- *Ensure the conditions of storage prevent deterioration and damage of stored items*
- *Assess the condition of product in stock*
- *Use an inventory management system to such as “first-in-first-out” (FIFO)*
- *Ensure segregation of serviceable product from unserviceable product*
- *Restricted to authorised personnel*



SABRe Chapter A

A5.1 Quality and delivery performance

- *Monitor quality and delivery performance*
- *Ensure 100% quality performance*
- *Ensure 100% on-time and in-full delivery performance*
- *Take appropriate corrective action when quality or delivery performance is not, or will not be, achieved*



SABRe Chapter A

A5.2 Audit process

- *Establish an annual audit programme (product and process audits) based on product and process risk*
- *Audit product selected at random to determine the following:*
 - *All operations are complete and verified*
 - *Dimensional and visual acceptability to product definition*
- *Audit each manufacturing process to determine if the resources and controls are effective and comply with requirements*
- *Take immediate action when an audit result identifies a product non-conformance*



SABRe Chapter A

A5.3 Release documentation

- *Provide separate release documentation with each delivery to Rolls-Royce*
- *Ensure that the release documentation...*
 - *Is written in English or in a language specified by the customer*
 - *Refers to a single purchase order / schedule*
 - *Refers to a single part number*
 - *Contains the minimum information specified in SABRe*
 - *Has a conformance / compliance statement*
- *Provide a certificate of analysis or raw material manufacturer's certificate with the shipment of raw material*



SABRe Chapter A

A5.4 Control of nonconforming product

- *Contain nonconformities to prevent unintended use or delivery*
- *Take necessary actions to contain the effect of the nonconformity (within 48 hours)*
 - *work in progress,*
 - *stores stock,*
 - *shipping area,*
 - *in transit,*
 - *sub-tier / subcontract activities,*
 - *similar products,*
 - *despatched / delivered to customer*
- *Immediately notify Rolls-Royce of any delivered nonconforming product*



SABRe Chapter A

A5.5 Deviation permit / concession

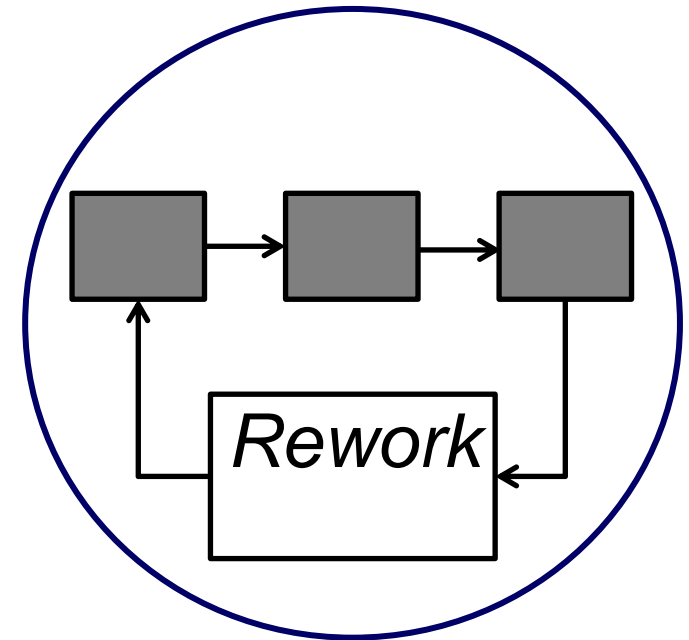
- *Written authorisation by Rolls-Royce prior to the shipment of a product which does not conform to specified requirements*
- *Submit the forms associated with this activity to Rolls-Royce*
- *Take appropriate corrective action*

e-concessions (electronic concession system) may be used where access has been granted

SABRe Chapter A

A5.6 Control of reworked product

- *Rework product in accordance with controls specified within the process specifications on the product definition or to an agreed rework procedure authorised by Rolls-Royce*
- *Ensure that instructions for rework, including re-verification / inspection requirements are accessible to and utilised by the appropriate personnel*

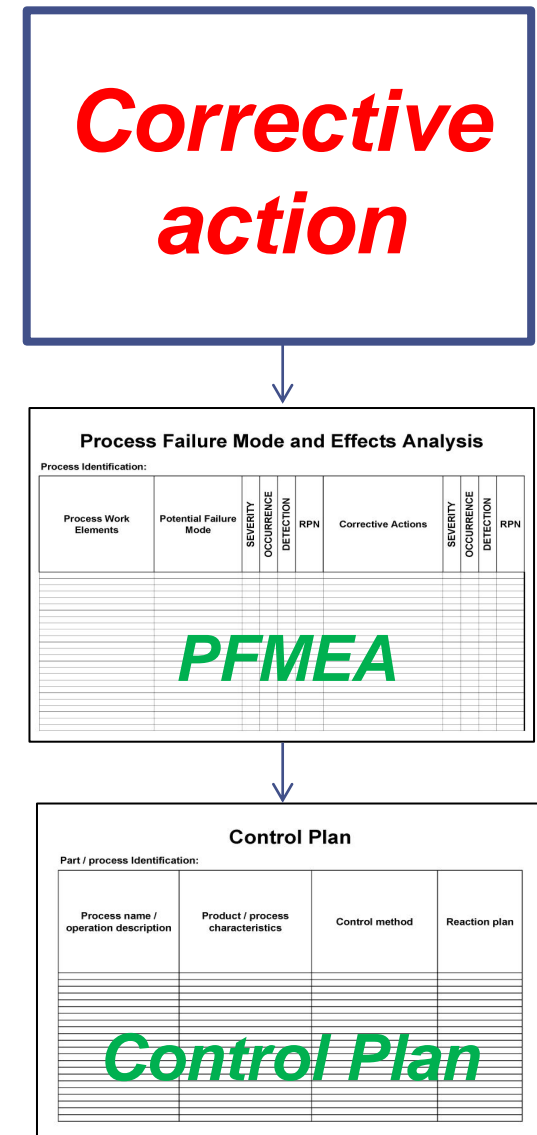


SABRe Chapter A

A5.7 Corrective action

- *Perform problem solving activities to establish the root of nonconformities*
- *Take appropriate corrective action to eliminate the causes of nonconformities in order to prevent recurrence*
- *Verify permanent fix*
- *Submit a PIR form to RR when:*
 - *A deviation permit or concession is to be submitted by the supplier*
 - *A nonconformance has been identified to the supplier by Rolls-Royce*

Problem Improvement Request (PIR)



SABRe Chapter B

SABRe Chapter B

B1.1 Project management

- *Plan, organise and manage resources to bring about the successful completion of specific project goals*
- *Establish a product (manufacturing) launch plan in advance of producing the product that refers to the requirements of all key production activities, timescales, resource requirements*



SABRe Chapter B

B1.2 Review of requirements related to the product

- *Review the requirements related to the product, purchase order / contract, prior to committing to supply the product or acceptance of orders / contracts*
- *Respond to requests related to quotations, proposals, purchase order / contract via Exostar*

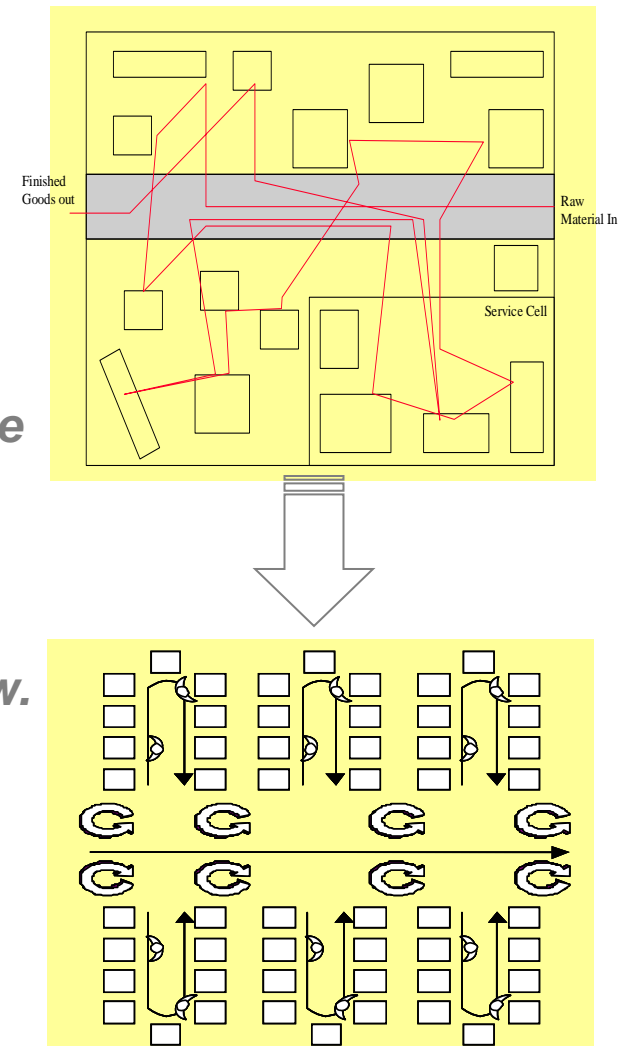


Exostar is an on-line system, which enables suppliers to view Rolls-Royce schedules and respond with delivery promises.

SABRe Chapter B

B1.3 Plant, facility and equipment planning

- *Develop plant, facility and equipment plans using a cross-function team*
- *Assess production feasibility to ensure that the product can be produced*
- *Ensure that plant layouts optimise material travel, handling and value-added use of floor space, and facilitate synchronous material flow.*



Synchronous material flow is a pull production system such as Kanban

SABRe Chapter B

B1.4 Production planning / scheduling

- *Plan / schedule production in order to meet customer requirements*
- *Communicate (flow down) production schedule information to subcontractors / sub-tier suppliers*
- *Review and respond to Rolls-Royce supply chain planning (Exostar) schedules on request*
- *Respond to Rolls-Royce Sales and Operations Review Board (SORB) on request.*

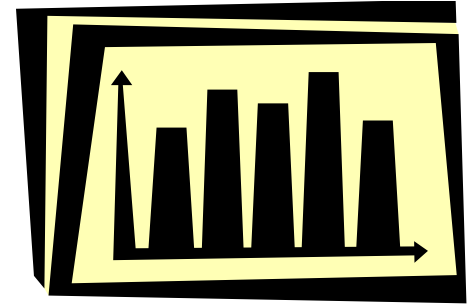


Exostar is an on-line system, which enables suppliers to view Rolls-Royce schedules and respond with delivery promises.

SABRe Chapter B

B1.5 Capacity planning / management

- *Establish a process to plan and manage production capacity*
- *Resolve discrepancies between the available capacity and the demands of the customer*
- *Implement Overall Equipment Effectiveness (OEE)*



SABRe Chapter B

B2.1 Product design and development

- *Comply with the requirements of Rolls-Royce Engineering Standard (RRES) 90009 (Requirements for design & development activities)*
 - *RRES 90009 specifies requirements to the Rolls-Royce Design and Development supply chain and is applicable to suppliers authorised by Rolls-Royce to create design definitions*
 - *Design and development suppliers (and their supply chain) will comply with RRES 90009, technical requirements and any additional contract specific process requirements.*
 - *The applicability of each RRES 90009 requirement will be defined by Rolls-Royce, agreed with the supplier and documented in a design and development quality plan / compliance matrix*
 - *RRES 90009 is available to view and download from the Rolls-Royce Global Supplier Portal (GSP) <https://suppliers.rolls-royce.com> on the standards and specifications web pages*

SABRe Chapter B

B2.2 Control of design changes

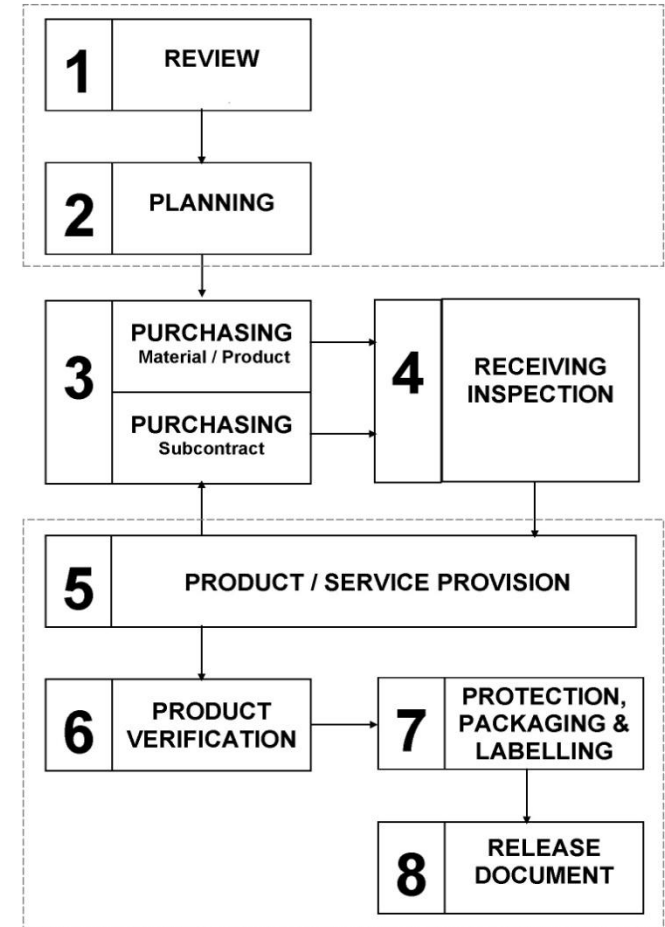
- *Design Control is applicable to:*
 - *Design changes that affect the fit, form or function of existing designs*
- *Ensure design changes are authorised by Rolls-Royce technical authority before implementation*
- *Design Control is applicable to design changes that affect the fit, form or function*

SABRe Chapter B

B3.1 Process flow diagram

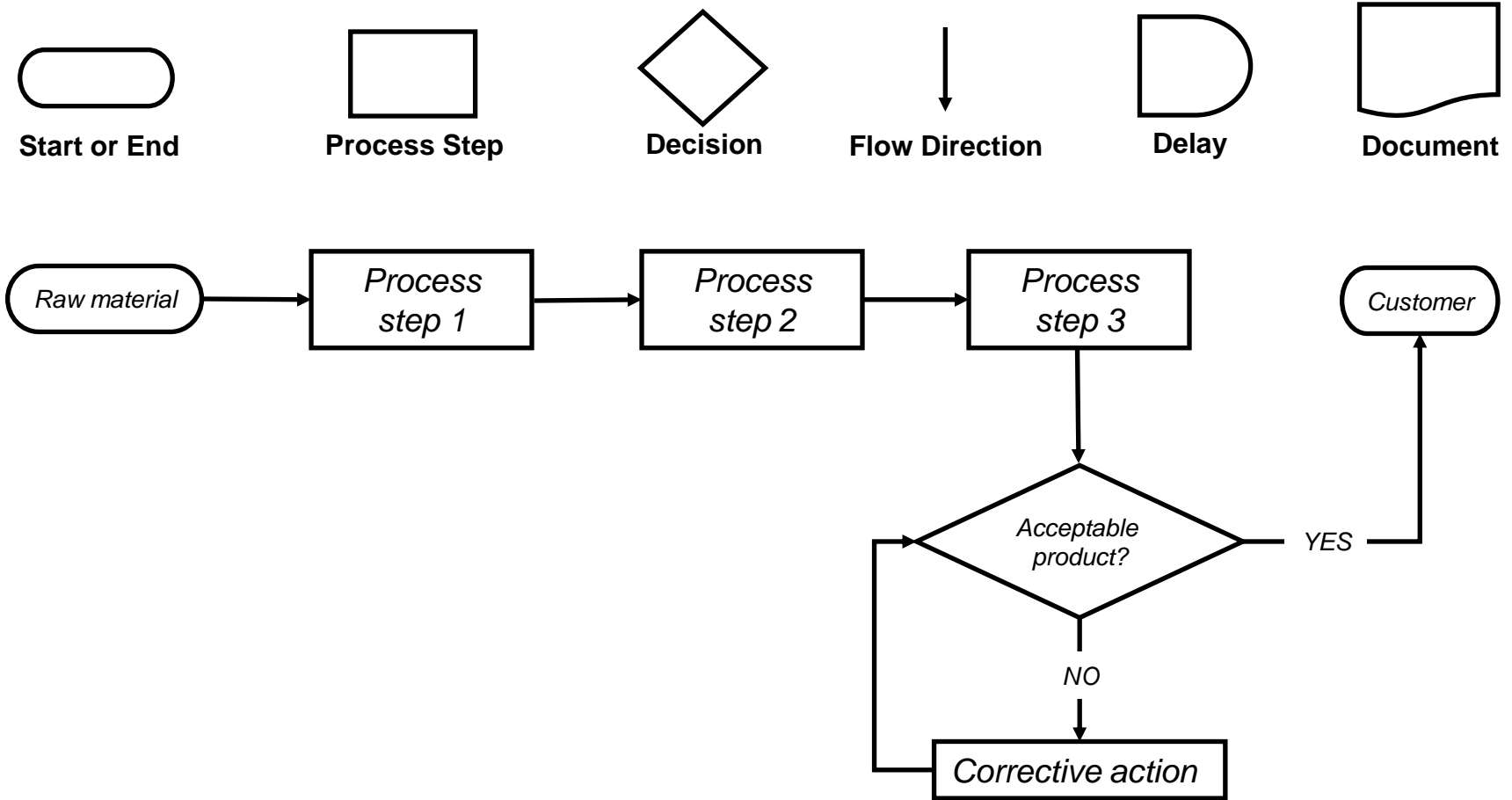
- *Develop and document the production process flow, from the beginning of the process up to the delivery of the product*
 - *Process operational sequence*
 - *Processes requiring a qualified operator*
 - *Identification of external activities*
 - *Product verification*
 - *Process performance metrics*

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 source.



SABRe Chapter B

Process flow diagram (example)



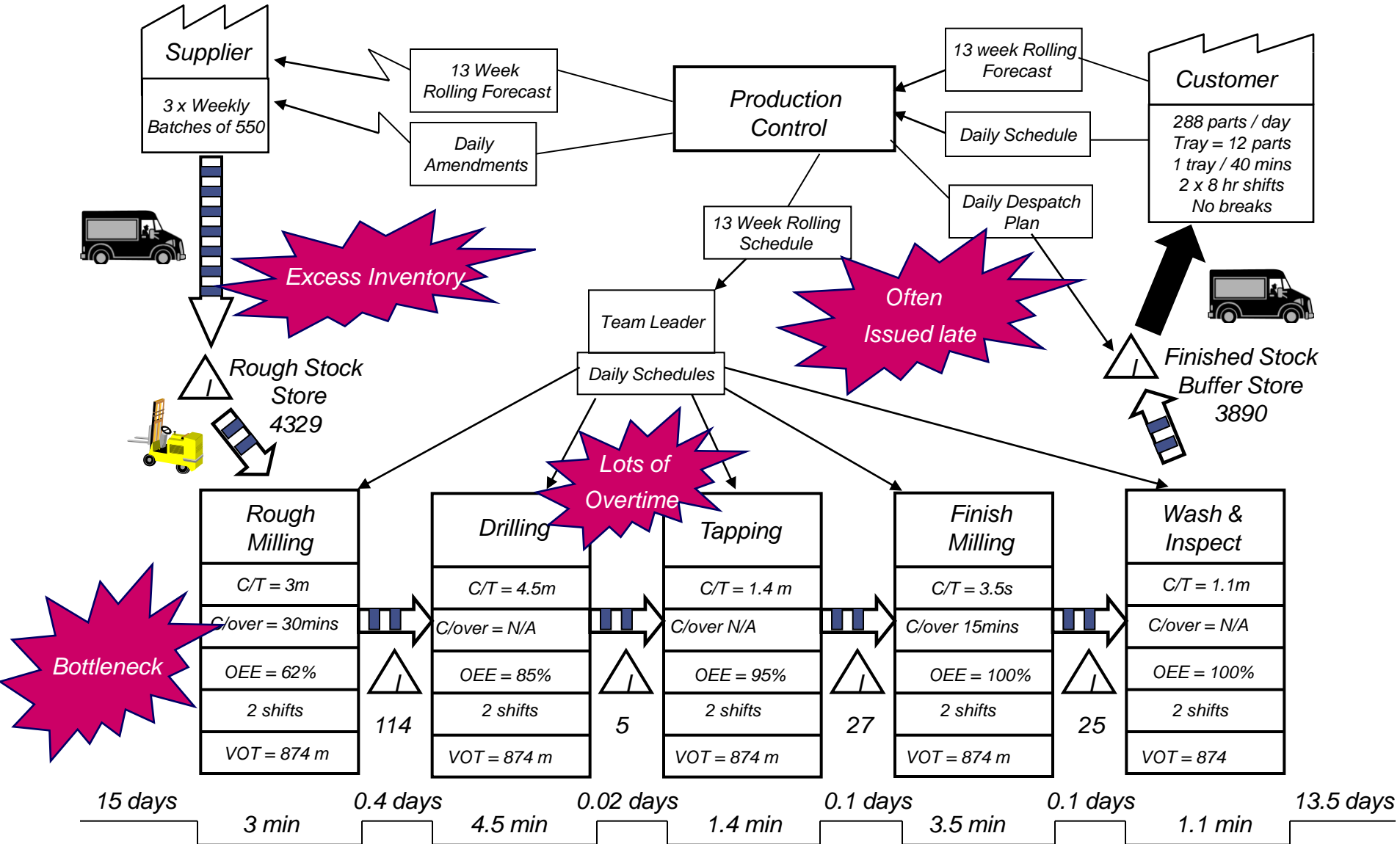
SABRe Chapter B

B3.2 Value stream mapping

- *Develop a value stream map of the product supply chain related to the production processes, from the beginning of the process up to the delivery of the product*
 - *Physical flow*
 - *Information flow*
 - *Key contributing parties*
 - *A baseline for improvement and the creation of a future state map*

NOTE: A single value stream map apply to a group or family of products that are produced by the same process at the same source.

Value Stream Mapping Example



SABRe Chapter B

B3.3 Test / inspection criteria and planning

- *Develop a characteristic matrix for all product characteristics and production operations*
- *Plan the test and inspection requirements related to product measurement*
 - *Where in the sequence the testing, inspection / measurement operations are performed*
 - *A reference to each product characteristic to be inspected*
 - *Type of measurement equipment required*
 - *Criteria for acceptance and / or rejection*

CHARACTERISTICS MATRIX							
PRODUCT CHARACTERISTICS	MANUFACTURING PROCESS OPERATIONS						
	DIM No:	DESCRIPTION	TOLERANCE	10	20	30	40
	1	ID	± 0.050	X	C		X
	2	FACE			X	C	
	3	OD				L	
	4	KC	± 0.005			X	X
	5	OD	± 0.050			X	
	6	OD	± 0.050			X	
	7	ID	± 0.050				X
	8	FACE				C	C
	9	CCF	± 0.005	X	X	X	X
	10	KC	± 0.005		X	X	
<p>C = Characteristic at operation used for clamping L = Characteristic at an operation used for locating X = Characteristic created or changed by this operation should match the process flow diagram CCF = Conformance Control Feature KC = Key Characteristic</p>							

SABRe Chapter B

B3.4 Process Failure Mode and Effects Analysis (PFMEA)

- Establish a PFMEA that includes...
 - Process identification
 - Process work elements
 - Potential process failure mode
 - Severity, Occurrence, Detection
 - Risk Priority Number (RPN)
 - Standard scoring
- Review / update and recalculate RPN's when changes are made to product definition, operating conditions or when nonconformance has been identified

[illegible]

SABRe Chapter B

B3.5 Control plan

- **Develop control plans that includes...**
 - **PFMEA outputs**
 - **Part / process number**
 - **Process name / operation description**
 - **Product / process characteristic**
 - **Control method**
 - **Reaction plan**
 - **Review / update control plans when a change occurs affecting product, production process, measurement, logistics, supply sources or PFMEA**

[illegible]

SABRe Chapter B

B3.6 Work instructions

- *Prepare documented work instructions for personnel having the responsibility for the operation of processes that impact product quality and are...*
 - *Accessible for use at the work station*
 - *Derived and cross referenced to sources such as the PFMEA and / or the control plan*



SABRe Chapter B

B3.7 Measurement System Analysis (MSA)

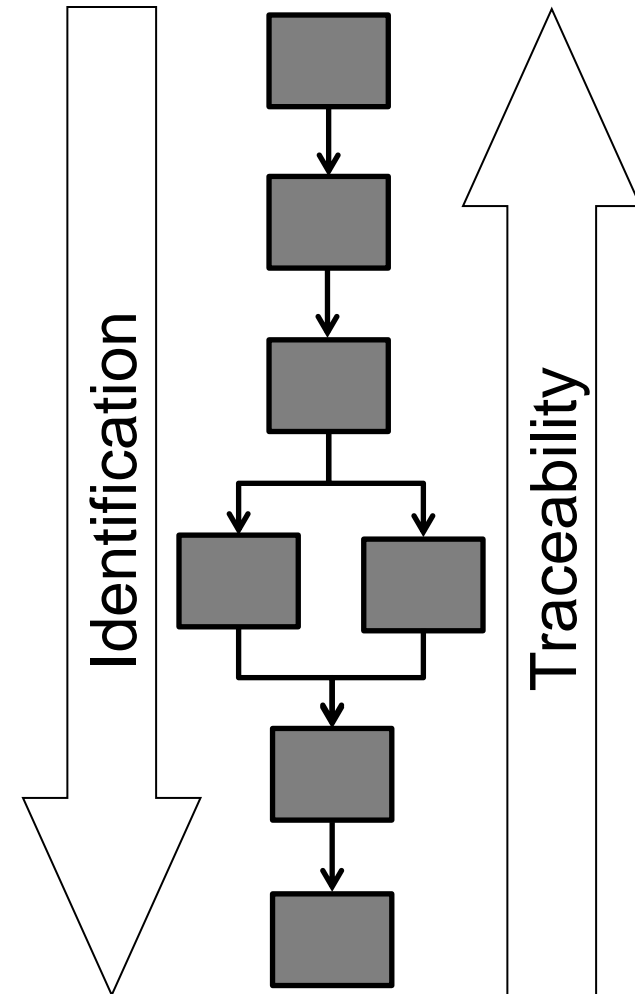
- *Ensure that the monitoring / measuring equipment used to perform product verification activities is calibrated*
- *Have personnel available who are trained and competent in...*
 - *The use of the monitoring / measuring equipment*
 - *Measurement systems analysis techniques*
- *Validate the measurement system by performing statistical studies...*
 - *Gauge Repeatability & Reproducibility*
 - *Attribute Agreement Analysis*



SABRe Chapter B

B3.8 Identification, traceability and serialisation

- *Identify raw material / product by suitable means throughout production activities*
- *Maintain the traceability for all product during production ...*
 - *product quantities,*
 - *split orders,*
 - *nonconforming product*
- *Control the unique and serialised identification of the product when specified by Rolls-Royce*
- *Establish a method to differentiate between an unfinished / incomplete product during subcontract / sub-tier supplier processing activities and a finished / completed product*



SABRe Chapter B

B3.9 Traceability of product provided by Rolls-Royce

- *The supplier may accept the release documentation from Rolls-Royce as sufficient evidence of product traceability*



SABRe Chapter B

B3.10 Tooling control

- *Establish a system for the management of tooling, jigs and fixtures...*
 - *Unique tool identification*
 - *Maintained as fit for purpose*
- *Ensure that tooling, jigs and fixtures owned by Rolls-Royce are controlled*
 - *Identified as Rolls-Royce owned*
 - *Tooling register established*
 - *Used only for Rolls-Royce applications*
 - *Audited annually plus periodic preservation / condition checks*
 - *Modifications / disposal only after written authorisation by Rolls-Royce*

SABRe Chapter B

B3.11 Protection, packaging and labelling

- *Products are packaged to a standard that provides adequate protection*
- *Product packaging is labelled to a standard that provides adequate identification and traceability*
- *Work instructions established for packaging and labelling of the product*
- *Packaging and Labelling Data Sheet is submitted to Rolls-Royce (on request)*

SABRe Chapter B

B4.1 Production verification

- *Measure 100% of all product characteristics related to all product to verify that requirements have been met*
- *Personnel performing product verification / inspection activities are appropriately trained and competent*
- *White light intensity of not less than 500 LUX*
- *Use the same units of measurement*
- *Independence of monitoring / measuring equipment*
- *Record the actual measurement results / values for product classified as “Critical” (see RRES90002) and where a CMM is the method of inspection*



Coordinate Measuring Machine (CMM)

SABRe Chapter B

B4.2 Reduced inspection

- *Reduced inspection of variables is 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 variables

- *Only apply reduced inspection of variables when:*
 - *Process stability and capability can be demonstrated and meets the requirements specified by Rolls-Royce*
 - *The proposed sample size and verification method has been documented in a control plan*
 - *The control plan has been submitted to, and authorised by Rolls-Royce*

SABRe Chapter B

B4.2 Reduced inspection (continued)

- *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.*

Reduced inspection of formed characteristics

- *Only apply reduced inspection of formed characteristics when:*
 - *Measurable evidence demonstrates that the control methods are effective and continually produce a product that conforms to requirements*
 - *The method by which the formed characteristic is produced plus the verification method and the verification intervals are documented in a control plan*
 - *The control plan and measurable evidence of product conformance have been submitted to, and authorised by the Rolls-Royce (on request)*

SABRe Chapter B

B4.3 Sample inspection

- *Sample inspection is the inspection of a sample of products taken from a batch from which the product conformity of the entire batch is derived.*

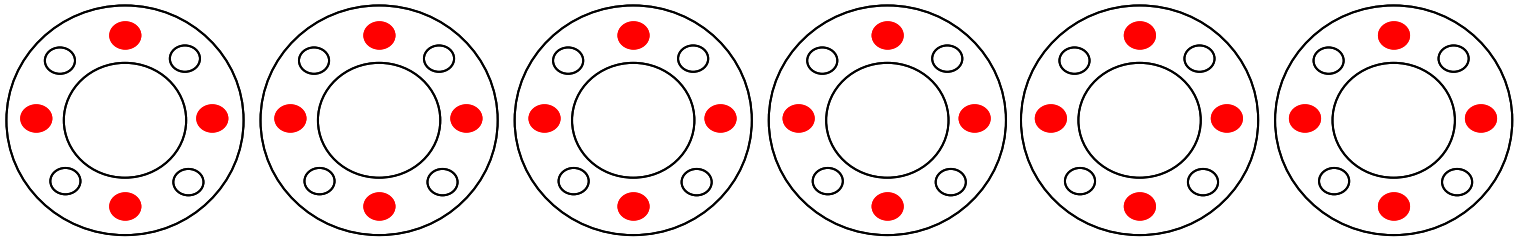
Sample inspection

- *Only apply sample inspection when:*
 - *Process stability and capability can be demonstrated using variation management (see B4.5)*
 - *The sample size and the verification method for each product characteristic has been documented in a control plan (see B3.5)*
 - *The control plan and statistical data (see B4.5) have been submitted to, and authorised by the Rolls-Royce*

SABRe Chapter B

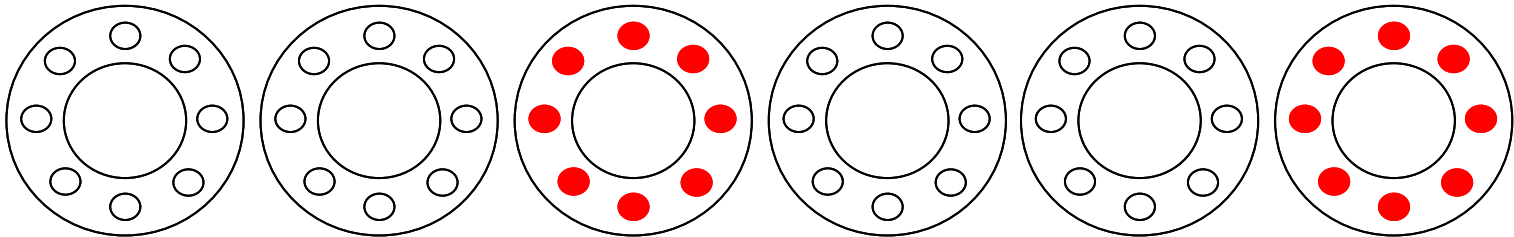
Reduced inspection (example)

The example shown below shows a batch of six (6) products where four (4) out of the eight (8) identical product characteristics taken from every product in the batch are used to derive the conformity of the remaining identical product characteristics.



Sample inspection (example)

The example shown below shows a batch of six (6) products where eight (8) identical product characteristics taken from a sample of two (2) products in the batch are used to derive the conformity of the entire batch.



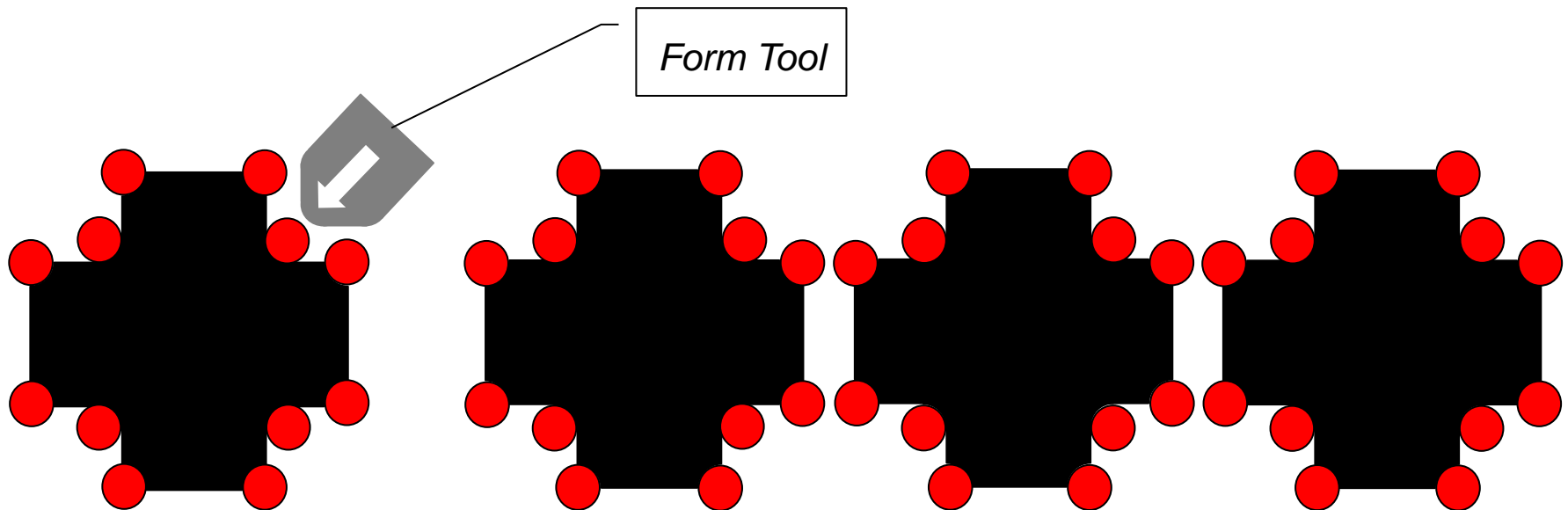
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Reduced inspection of formed characteristics (example)

The example shown below shows a batch of four (4) products with twelve (12) product characteristic produced by a form tool (shown as ●).

Appropriate control methods such as control of process settings, tooling, standard processes and / or error-proofing will be introduced

The inspection of the form tool and a sample of the product characteristic produced by the form tool is used to verify the conformity of the remaining identical product characteristics of the entire batch.



SABRe Chapter B

B4.4 First / Last Article Inspection Report (FAIR / LAIR)



- *First Article Inspection Report (FAIR) will be used to verify conformance of:*
 - *Products designed and / or produced by a supplier for a Rolls-Royce application*
 - *Assemblies and all levels within an assembly, including castings and forgings*
 - *Repair instructions / schemes*
- *FAIR does NOT apply to:*
 - *Purchased standard catalogue hardware or deliverable software*
 - *Elements of the process related to material or product provided by Rolls-Royce*

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B4.4 First / Last Article Inspection Report (continued)

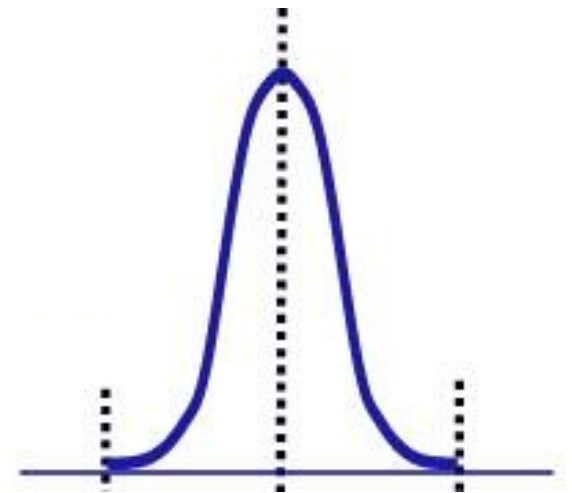
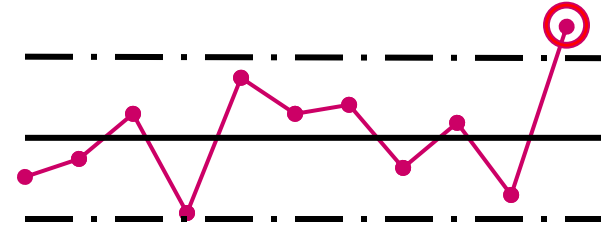
- *Implement the requirements of AS/EN/SJAC 9102 (where applicable)*
- *Perform a FAI on the first production product to be delivered*
- *Perform FAI / LAI dimensional inspection at the end of the production process using:*
 - *Capable measuring equipment (see B3.7)*
 - *Measuring equipment and inspection personnel independent of that used in the production process*
- *Perform a LAIR when the source of complete production is planned to change or at the request of Rolls-Royce*
- *Only release product into Rolls-Royce against an approved FAIR*



SABRe Chapter B

B4.5 Variation management

- *Designate Key Characteristics (KCs)...*
- *Identify Conformance Control Features (CCFs)...*
 - *Perform statistical process control (SPC) to demonstrate they are in a state of statistical control and that capability has been established*
 - *Ensure that variable data demonstrates process capability of $C_{pk} \geq 1.33$*



SABRe Chapter B

B4.6 Definition Alteration Request (DAR)

- *DAR is applicable to:*
 - *Changes that DO NOT affect fit, form or function*
 - *Changes that impact upon Rolls-Royce requirements*
 - *Changes that require a decision by Rolls-Royce Engineering*
- *Ensure DAR's are authorised by Rolls-Royce before implementation*

SABRe Chapter B

B4.7 Fixed process control

- *Applies when product definition specifies ‘Fixed Process Control’:*
- *Plan and develop Fixed Process Control documentation (RRES 90000)*
- *Produce products in accordance with Fixed Process Control Document*

SABRe Chapter B

B5.1 Production (process requirements)

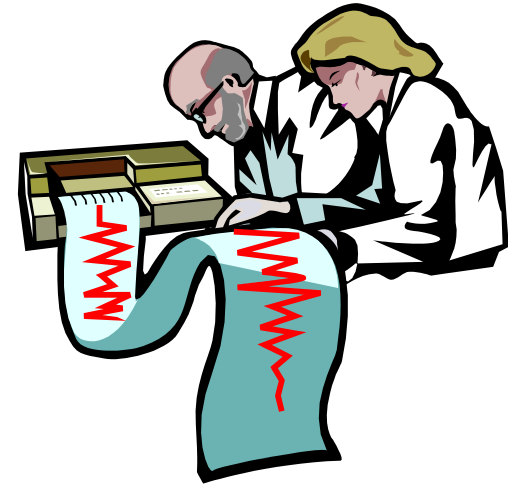
- *Comply with chapters A and B when current production activities have been established i.e. will be applied retrospectively by suppliers currently producing a product with an approved FAIR (see B4.4).*
- *Comply with chapters A, B and C when conducting activities related to New Product Introduction (NPI) and Product Introduction (PI).*



SABRe Chapter B

B5.2 Production process performance metrics

- *Develop production process performance metrics that monitor...*
 - *Statistical process control*
 - *Cycle-time and lead-time adherence*
 - *Process yield rates (% scrap, % rework)*
 - *Product % Right First Time*
- *Feedback performance metrics for process improvement*



SABRe Chapter C

SABRe Chapter C

Production Product Approval Process

- *PPAP demonstrates that:*
 - *All customer requirements are properly understood, verified and recorded by the product supplier*
 - *The supplier has the potential to produce product consistently meeting these requirements during production at a quoted production rate*

PPAP has commonality with AIAG's PPAP (Production Part Approval Process) but differences exist given the distinctive requirements of Rolls-Royce

SABRe Chapter C

Production Product Approval Process

- *PPAP is applicable as follows:*
 - *New Product Introduction (NPI)*
 - *Product Introduction (PI)*
 - *When requested by the customer.*
- *PPAP will have a phased implementation and will be introduced on a product and project basis across the Rolls-Royce supply chain.*
- *The requirement to conduct PPAP activities will be communicated to the supplier via a PPAP applicability matrix which is available to view and download from the Rolls-Royce Global Supplier Portal (GSP)*
<https://suppliers.rolls-royce.com>

NOTE: All questions concerning the need for PPAP should be addressed to the Rolls-Royce technical authority.

SABRe Chapter C

Production Product Approval Process

- *PPAP file*
 - *Gather supporting data for the PPAP in a file*
- *Production run*
 - *Perform a production run to determine the potential to achieve the customer demand rate*
- *Submission Level (SL) and PPAP elements*
 - *Identifies the information to be submitted to the customer (use submission level 3 as the default level)*
 - *The required PPAP elements are shown in a table and specify the evidence required to demonstrate that these requirements have been met*
- *Production Submission Warrant (PSW)*
 - *Submit the PSW form to Rolls-Royce stating the reason for submission and the level of documents submitted to the verify / validate the PPAP activities.*

SABRe Overview

END