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<b>Title:</b>	<b>Safe Launch Process Description</b>	<b>Effective date:</b>	2021.02.01
<b>Scope<sup>1</sup>:</b>	<ul style="list-style-type: none"><li>• ZF Group (ZF Friedrichshafen AG and all of its directly and indirectly controlled subsidiaries)</li><li>• Corporate Function(s): Q-Quality S-Materials Management</li><li>• Suppliers and Sub-Suppliers for whom safe launch is applicable</li></ul>		
<b>Purpose and Content:</b>	This procedure defines a uniform method for the realization of the Safe Launch process within the supply chain		
<b>Original Language:</b>	English		

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<sup>1</sup> Annotation: Policy Statements always apply to the whole ZF Group (ZF Friedrichshafen AG and all of its directly and indirectly subsidiaries). Directives and Work Instructions must identify proper subgroup classification: Corporate Function; Division; Business Unit; Product Line; Region; Nation; Location; or Legal Entity



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## 1. History and Change Log

Chapter	Page	Type of revision	Revision	
			No.	Date
All	All	The new edition is fully revised and comes with a new structure, describing in detail the complete process of Safe Launch. It includes a Safe Launch Process Landscape and a Safe Launch specific work and communication form (PCM-SLP).	02	2021-02-01
All	All	First edition – published on 01.01.2018 as a part of QD83-2018. This first edition intended to provide supplementary information on the Safe Launch Process to complete the corresponding sections in QD83 (2.12 and 4.4).	01	2018-01-01

## 2. Purpose

Safe Launch is a process of elevated inspection and monitoring activity by suppliers, from PPAP until Safe Launch exit.

The purpose of Safe Launch is to:

- (1) ensure defect free supplies,
- (2) detect and address failure modes,
- (3) identify potential issues in new production processes.

The Safe Launch process protects the ZF customer, the ZF receiving plant and the ZF Supplier.

The purpose of this Procedure is to facilitate the planning, execution and exit of Safe Launch for the Safe Launch Team by describing the objective, scope, requirements and activities during Safe Launch.

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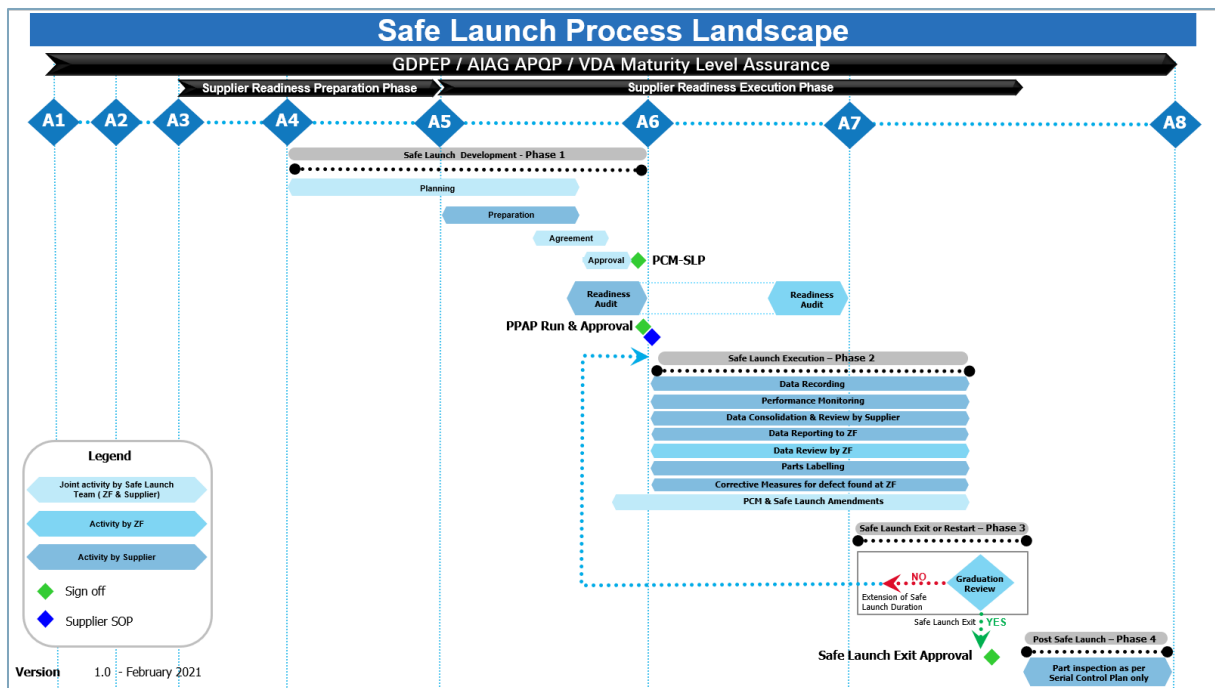
### 3. Scope

Safe Launch is to be applied only to Suppliers / Sub-Suppliers and parts identified by ZF as Safe Launch relevant.

ZF may choose to apply Safe Launch on new projects, new developments, high risk parts, customer requested parts, supplier change, select cases of supplier process changes and sub-supplier changes. If Safe Launch is required, the Supplier will be notified by ZF.

Safe Launch applies to components and sub-components whose processes influence characteristics listed in the PCM. Therefore, it may apply not only to the ZF direct supplier but also to sub-suppliers.

### 4. Process Landscape



Full size version: see QD83, section 4.4

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## 5. Work and Communication Form

Unless otherwise specified by ZF, the work and communication form to be used by the Supplier to record all information pertaining to the Safe Launch Process is the following:

File Name: QD83 F2.12 PCM-SLP.XLS.

Full Name: Product Characteristic Matrix – Safe Launch Plan

Location: This file is available on the [Internet ZF Website on QD83](#) in section 2.12.

The PCM-SLP Form consists of 6 Tabs designed to record all information related to the Definition and Execution of the Safe Launch process as follows:

PCM-SLP Tabs	Purpose
[PCM-SLP Template]	To document the definition of the Safe Launch Plan and the commitment of the Safe Launch Team to this plan
[Recording of Safe Launch Data]	To record and report Safe Launch data
[SLP Performance Monitor]	To record failures per characteristic To monitor collected Safe Launch Data
[SL Readiness Audit]	For the supplier to carry out a self-evaluation on their Safe Launch Readiness. For ZF to assess the results.
[SLP Label]	To print and apply to all shipments containing SL Parts
[Rev. / Change Log]	To inform about the current revision and the last changes made to the form

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## 6. Definitions

### Safe Launch Plan

The Safe Launch Plan (SLP) is an individual plan by component designed to contribute to a flawless launch by increasing inspection and/or controls.

### Safe Launch Execution

The Safe Launch Execution comprises of all the actions required to be carried out from PCM approval until Safe Launch Exit.

## 7. Abbreviations

APQP – Advanced Product Quality Planning

PCM – Product Characteristics Matrix

SLP – Safe Launch Plan

PCM-SLP – Product Characteristic Matrix – Safe Launch Plan

PPAP – Production Part Approval Process

QD83 – ZF Global Supplier Quality Directive

SOP – Start of Production

SOE – Supplier Quality Engineer

SQA – Supplier Quality Assurance

SDE – Supplier Development Engineer

## 8. Responsibilities

Supplier responsibilities are defined in QD83 (sections 2.12 and 4.4) and in this procedure.

ZF responsibilities are defined by each Division.

## 9. Team

The Safe Launch Team shall consist at a minimum of the following:

### Supplier:

- Supplier Representative, who will be the single point of contact
- Relevant functions within the Supplier organization which can contribute to a successful Safe Launch

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ZF:

- SQE / SQA
- SDE
- Engineering (as required) - Design Engineer

If needed, the team may be expanded to include representatives from other relevant functions.

## 10. Inputs

The following documents and information are base inputs for the preparation, execution and reporting during the Safe Launch activities:

- Purchase contract
- Design records
- Technical Review Workbook
- Results from quality planning meetings
- Relevant pre-launch expectations
- PCM-SLP form (QD83 F2.12)
- Lessons learned from previous launches

## 11. Safe Launch Development – Phase 1

### 11.1 Planning

To begin with, the Supplier shall consider ZF expectations and requirements detailed in the [SL Readiness Audit] Tab in form PCM-SLP.XLS (QD83, form F2.12)

The Supplier shall consider the necessary resources and facilities needed for Safe Launch execution. These shall include, but are not limited to:

- Qualified and adequate personnel for carrying out Safe Launch activities, across all shifts.
- Relevant, adequate and qualified inspection facilities (metrology lab, inspection equipment, gaging... etc.)

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- Inspection methodologies for 100% checks may be different from methodologies for periodic checks. Both methodologies shall be qualified for MSA and have acceptable correlation.
- Capability studies for all identified characteristics, where possible.
- Suitable data recording tools
- Etc....

To enhance inspection capacity, 3rd party services may be planned for engagement during Safe Launch duration (refer to section 11.3.1 - Safe Launch Plan – Agreement & Approval).

## 11.2 Preparation

### 11.2.1 Characteristics

The Safe Launch Plan shall be documented and agreed upon in the PCM-SLP form (QD83 F2.12). All characteristics identified as key to Safe Launch during Technical Review and APQP shall be recorded in the [PCM-SLP Template] Tab.

The characteristics to be considered are Special Characteristics

- as identified on ZF drawings / specifications
- as identified by the supplier
- defined as a Customer Touch Point (CTP)

The Special Characteristics types to be considered are:

- C - Critical Characteristic
- S – Significant Characteristic
- PTC - Pass Through Characteristic
- P – Process Characteristic

Furthermore, the following shall also be considered:

- Known characteristics with history of quality issues (Lessons Learned)
- Key assembly characteristics
- Potential areas of concern identified during APQP
- Appearance items (e.g. dents, damages, burrs, visual defects, etc.)

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## 11.2.2 Inspection Levels

The Supplier shall recommend the planned serial control method, inspection frequency and sample size for all documented characteristics.

For Safe Launch controls the Supplier shall plan as follows:

- Whenever possible, use 100% inspection
- If 100% inspection is not possible, increase inspection frequency and sample size as compared to serial production controls.
- Where 100% inspection is already in place, the Supplier shall consider increasing the calibration frequency of the gauge / instrument / fixture / Master Part.

## 11.3 Safe Launch Plan – Agreement & Approval

### 11.3.1 Agreement

The Safe Launch Team shall review the Safe Launch Plan to agree on suitability of control methods, adequacy of inspection frequencies and sample sizes.

Safe Launch duration (refer to section 10.1) and Safe Launch data submission frequency (refer to section 9.3.3) shall be agreed.

Where third-party resources are engaged for inspection, supplier shall secure ZF's approval for such resources, equipment, and measurement technique prior to Safe Launch.

### 11.3.2 Approval

The Safe Launch Plan shall be approved by means of the necessary signatures in the commitment section of the [PCM-SLP Template], as required by ZF. The approved Safe Launch Plan shall be submitted as part of the PPAP (refer to QD83 form F3.3A – Submission Levels).

## 11.4 Readiness Audit

To ensure Safe Launch Readiness, the Supplier shall conduct a Self-Assessment by answering the questions in the "Safe Launch – Readiness Audit" Tab. The objective is to complete the audit with the result of "passed".

Unless otherwise specified by ZF, the result shall be submitted to ZF prior to the PPAP run.

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In addition, ZF may conduct readiness audit during PPAP run or before commencement of Safe Launch.

## 12. Safe Launch Execution – Phase 2

### 12.1 Data Recording

The Safe Launch execution phase and data recording shall start at the latest from the PPAP run. The supplier shall ensure they have adequate methods (check sheets, etc.) to record the data at the point of inspection. These check sheets shall correlate with the contents of the Safe Launch Plan [PCM-SLP Template].

### 12.2 Performance Monitoring

The Supplier shall closely monitor product and process quality performance during the Safe Launch period. Appropriate countermeasures shall be planned and executed in a timely manner for all of the defects observed.

### 12.3 Data Consolidation

For all agreed PCM characteristics, the supplier shall consolidate process data, all raw data from inspection, capability reports, SPC charts and internal rejections against each production lot and / or production week. Time bound corrective and preventive actions shall be planned for high internal rejects and any quality concern reported by ZF.

### 12.4 Data Review by Supplier

The Supplier is expected to review the collected and consolidated data regularly and react appropriately.

### 12.5 Data Reporting to ZF

The Supplier shall transfer the consolidated data regularly into the ZF format, using the tab [Recording of Safe Launch Data].

In case of detected failures, the supplier shall transfer the defined actions into the ZF format, using the tab [SLP Performance Monitor]. Each action shall have a named responsible person and target date.

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Safe Launch data reporting frequency shall be either weekly or monthly or with every shipment or as per batch size agreed during Safe Launch agreement. The Supplier shall send the Excel file containing the Safe Launch data to the contact person defined by ZF.

Unless otherwise specified by ZF, the Safe Launch data shall be accompanied by raw inspection data, capability reports, process data and other data / reports

## 12.6 Data Review by ZF

ZF may review the submitted data and action plan and request additional information if required.

## 12.7 Parts Labelling

Prior to shipping the SLP-Parts to ZF, the Supplier shall identify all packages accordingly by applying the SLP label on each box and their pallets, skids and containers. See "SLP Label" in PCM-SLP form (QD83 F2.12).

## 12.8 Corrective Measures for defects found at ZF

For quality defects detected at ZF during the Safe Launch Period, the Supplier shall implement necessary containment, corrective and preventive actions.

## 12.9 PCM and Safe Launch Amendments

If ZF detects an issue during Safe Launch on a characteristic, the supplier shall proceed as follows:

- If the characteristic **is** a part of the PCM: the sample size, frequency and method need to be reviewed for suitability
- If the characteristic is **not** a part of the PCM: the characteristic shall be added to the PCM / SLP.

If a print undergoes revision during Safe Launch, the changes shall be considered for inclusion in the PCM / SLP.

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## 13. Safe Launch Exit or Restart – Phase 3

### 13.1 Start, End and Duration

#### Start Point of Safe Launch (Execution Phase)

The Safe Launch Execution Phase starts with the PPAP run.

If parts are to be supplied before PPAP, under a deviation, the Safe Launch Plan shall be applied.

#### End Point of Safe Launch (Execution Phase)

Generally, the Safe Launch Execution Phase ends at ZF Customer SOP + 90 days (at a minimum).

#### Duration of Safe Launch Execution Phase

The duration shall be either:

- a number of parts
- a number of days

#### Important criteria for the duration

The Safe Launch duration shall be long enough, or the number of parts to be produced under Safe Launch conditions high enough, to allow for an assessment of the Supplier's process variations. The Safe Launch Team (ZF and Supplier) shall determine an adequate duration to fulfill this requirement.

However, it will be extended if the exit criteria are not met. Scenarios that would extend the duration are defined in section 10.2.2.

### 13.2 Graduation Review

ZF may conduct a review of the Safe Launch data to decide upon "Safe Launch Exit" or "Extension" of Safe Launch.

#### 13.2.1 Exit

To exit Safe Launch, the following criteria shall be met:

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- successful shipment of parts with zero defects to ZF and / or ZF customer during the entire Safe Launch duration
- achievement of internal reject rate demonstrating a stable and capable process during the entire Safe Launch duration

For parts that are not able to qualify for an extended period, the Safe Launch frequency shall become the Control Plan frequency.

### 13.2.2 Extension of Safe Launch duration

Each characteristic will be reviewed individually. ZF may extend the entire Safe Launch duration if the exit criteria are not met. Alternately ZF may extend the Safe Launch duration only for characteristics that do not meet the exit criteria.

The Safe Launch duration may also get extended upon request from ZF customers.

In the event of an extension, the ZF receiving plant will inform the Supplier.

## 14. Post Safe Launch – Phase 4

Upon exiting Safe Launch, the serial production control plan shall be applied.

## 15. Related documents

### Supplier relevant directives

- QD83 - Global Supplier Quality Directive

### Work and Communication Forms

- Form PCM-SLP.XLS (Product Characteristic Matrix – Safe Launch Plan)  
(QD83 - Section 2.12)
- Form SLP Label (Identification of Parts under Safe Launch Plan)  
(QD83 - Section 2.12)

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