Advanced Product Quality Planning and Control Plan

APQP

Second Edition

This is a preview of "AIAG APQP:2008". Click here to purchase the full version from the ANSI store.

ADVANCED PRODUCT QUALITY PLANNING (APQP) AND CONTROL PLAN

Reference Manual

Second Edition

Issued June 1994, Second Printing February 1995 (new cover only), Second Edition, July 2008
Copyright © 1994, © 1995, © 2008
Chrysler Corporation, Ford Motor Company, and General Motors Corporation
ISBN: 978-1-60534-137-8

This is a preview of "AIAG APQP:2008". Click here to purchase the full version from the ANSI store.

FOREWORD

Second Edition

Effective November 1, 2008, APQP and Control Plan Second Edition replaces APQP and Control Plan First Edition unless otherwise specified by your customer.

APQP and Control Plan Second Edition includes:

- incorporation of the customer focused process approach
- updated terminology and concepts consistent with ISO/TS 16949 and other Chrysler, Ford and General Motors core tool manuals
- appropriate references to customer specifics provided without the full text

This manual continues to provide general guidelines for ensuring that Advanced Product Quality Planning is implemented in accordance with the requirements of the customer. It does not give specific instructions on how to arrive at each APQP or Control Plan entry, a task best left to each organization.

While these guidelines are intended to cover most situations normally occurring either in the early planning, design phase, or process analysis, there will be questions that arise. These questions should be directed to your authorized customer representative.

The Supplier Quality Requirements Task Force gratefully acknowledges the contributions of the following individuals and their respective companies that participated in the revision process.

Bryan Book, Chrysler LLC, Chair
Russ Hopkins, Ford Motor Company
William Fick, General Motors Corporation
Robert Minkler, Delphi Corporation
Craig Williams, Eaton Corporation

This document is copyrighted by Chrysler LLC, Ford and General Motors, all rights reserved, 2008. Additional copies can be ordered from AIAG at www.aiag.org. Organizations purchasing APQP Second Edition have permission to copy any forms and/or checklists contained herein.

July 2008

This is a preview of "AIAG APQP:2008". Click here to purchase the full version from the ANSI store.

TABLE OF CONTENTS

FOREWORD III

TABLE OF CONTENTS V

INTRODUCTION 1
FUNDAMENTALS OF PRODUCT QUALITY PLANNING 3
Organize the Team 3
Define the Scope 3
Team-to-Team 4
Training 4
Customer and Organization Involvement 4
Simultaneous Engineering 4
Control Plans 4
Concern Resolution 5
Product Quality Timing Plan 5
Plans Relative to the Timing Chart 5

CHAPTER I PLAN AND DEFINE PROGRAM 7

INTRODUCTION 9
1.1 Voice of the Customer 9
1.2 Business Plan and Marketing Strategy 11
1.3 Product/Process Benchmark Data 11
1.4 Product/Process Assumptions 12
1.5 Product Reliability Studies 12
1.6 Customer Inputs 12
1.7 Design Goals 12
1.8 Reliability and Quality Goals 12
1.9 Preliminary Bill of Material 12
1.10 Preliminary Process Flow Chart 13
1.11 Preliminary Identification of Special Product and Process Characteristics 13
1.12 Product Assurance Plan 13
1.13 Management Support 14

CHAPTER 2 PRODUCT DESIGN AND DEVELOPMENT 15

INTRODUCTION 17
2.1 Design Failure Mode and Effects Analysis (DFMEA) 18
2.2 Design for Manufacturability and Assembly 18
2.3 Design Verification 19
2.4 Design Reviews 19
2.5 Prototype Build - Control Plan 20
2.6 Engineering Drawings (Including Math Data) 20
2.7 Engineering Specifications 21
2.8 Material Specifications 21
2.9 Drawing and Specification Changes 21
2.10 New Equipment, Tooling and Facilities Requirements 21
2.11 Special Product and Process Characteristics 21
2.12 Gages/Testing Equipment Requirements 22
2.13 Team Feasibility Commitment and Management Support 22

CHAPTER 3 PROCESS DESIGN AND DEVELOPMENT 23

INTRODUCTION 25
3.1 Packaging Standards and Specifications 26

This is a preview of "AIAG APQP:2008". Click here to purchase the full version from the ANSI store.

3.2 Product/Process Quality System Review ... 26
3.3 Process Flow Chart ... 26
3.4 Floor Plan Layout ... 26
3.5 Characteristics Matrix ... 27
3.6 Process Failure Mode and Effects Analysis (PFMEA) ... 27
3.7 Pre-Launch Control Plan ... 27
3.8 Process Instructions ... 28
3.9 Measurement Systems Analysis Plan ... 28
3.10 Preliminary Process Capability Study Plan ... 29
3.11 Management Support ... 29

CHAPTER 4 PRODUCT AND PROCESS VALIDATION ... **31**

INTRODUCTION ... 33
4.1 Significant Production Run ... 34
4.2 Measurement Systems Analysis ... 34
4.3 Preliminary Process Capability Study ... 34
4.4 Production Part Approval ... 35
4.5 Production Validation Testing ... 35
4.6 Packaging Evaluation ... 35
4.7 Production Control Plan ... 35
4.8 Quality Planning Sign-Off and Management Support ... 35

CHAPTER 5 FEEDBACK, ASSESSMENT AND CORRECTIVE ACTION ... **37**

INTRODUCTION ... 39
5.1 Reduced Variation ... 39
5.2 Improved Customer Satisfaction ... 40
5.3 Improved Delivery and Service ... 40
5.4 Effective Use of Lessons Learned/Best Practices ... 40

CHAPTER 6 CONTROL PLAN METHODOLOGY ... **41**

INTRODUCTION ... 43
6.1 Control Plan Column Descriptions ... 47
6.2 Process Analysis ... 56

APPENDIX A PRODUCT QUALITY PLANNING CHECKLISTS ... **71**

APPENDIX B ANALYTICAL TECHNIQUES ... **88**

Assembly Build Variation Analysis ... 89
Benchmarking ... 89
Cause and Effect Diagram ... 89
Characteristics Matrix ... 90
Critical Path Method ... 91
Design of Experiments (DOE) ... 91
Design for Manufacturability and Assembly ... 92
Design Verification Plan and Report (DVP&R) ... 92
Mistake Proofing/Error-Proofing ... 92
Process Flow Charting ... 93
Quality Function Deployment (QFD) ... 93

APPENDIX C REFERENCE MATERIAL ... **95**

APPENDIX D TEAM FEASIBILITY COMMITMENT ... **97**

APPENDIX E PRODUCT QUALITY PLANNING SUMMARY AND APPROVALS ... **99**

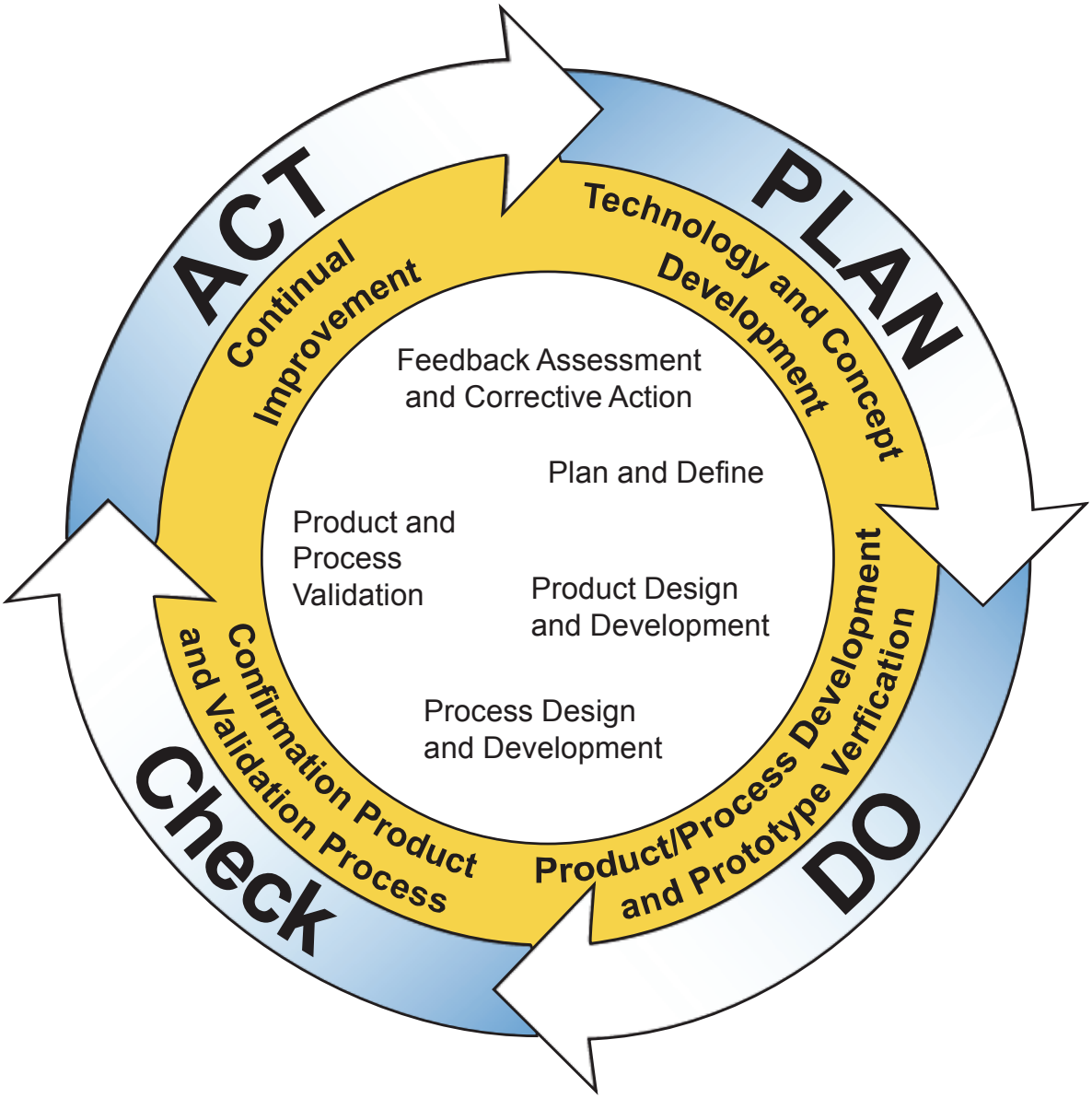
APPENDIX F GLOSSARY ... **102**

APPENDIX G INDEX ... **105**

This is a preview of "AIAG APQP:2008". Click here to purchase the full version from the ANSI store.

This is a preview of "AIAG APQP:2008". Click here to purchase the full version from the ANSI store.

PRODUCT QUALITY PLANNING CYCLE



This is a preview of "AIAG APQP:2008". Click here to purchase the full version from the ANSI store.

Introduction

The purpose of this manual is to communicate to organizations (internal and external) and suppliers, common Product Quality Planning and Control Plan guidelines developed jointly by Chrysler, Ford and General Motors. This manual provides guidelines designed to produce a product quality plan, which will support the development of a product or service that will satisfy the customer (see Section 1.6). The following terms, used in this edition are used to describe the supply chain. The term "organization" refers to the unit to which these guidelines apply. The term "supplier" replaces the term subcontractor that was used in the First Edition. Some of the expected benefits in using these guidelines are:

- A reduction in the complexity of product quality planning for the customers and organizations.
- A means for organizations to easily communicate product quality planning requirements to suppliers.

This reference manual contains guidelines that support the requirements as described in ISO/TS 16949 and applicable customer-specific requirements. All forms in this manual are provided as examples only. The purpose is to assist the organization's product quality planning team in developing the appropriate communication forms to support meeting customer requirements, needs, and expectations.

The Product Quality Planning Cycle shown on the facing page is a graphic depiction of a typical program. The various phases are sequenced to represent planned timing to execute the functions described. The purpose of the Product Quality Planning Cycle is to emphasize:

- Up-front planning. The first three quarters of the cycle are devoted to up-front product quality planning through product/process validation.
- The act of implementation. The fourth quarter is the stage where the importance of evaluating the output serves two functions: to determine if customers are satisfied, and to support the pursuit of continual improvement.

Depicting product quality planning as a cycle illustrates the never-ending pursuit of continual improvement that can only be achieved by taking the experience in one program and applying that acquired knowledge to the next program.