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1 Purpose

1.1 The purpose of Stage 1 is to evaluate an idea for a new product or significant product enhancement. The idea is evaluated based on a fit within the MTS strategy, technical viability, and market need.

2 Scope – *applies to where & when the procedure is used*

2.1 This process applies to all North American based R&D programs for MTS Test.

3 Definitions and Acronyms

3.1 SPD Systems Product Development

4 Graphic (if needed)

Stage 1 High Level
Concept Generation Re

5 Responsibilities

5.1 See Graphic

6 Procedure

6.1 Approve Development Program

The R&D council approves the development program and notifies the Product Manager and Development Management.

Output: Stage 1 Approval Email (Quality Record 7.1)

Template: None

6.2 Receive Product Requirements

The Product Manager develops the Product Requirements.

Output: None

Template: None

6.3 Assign Program Leader

Development Management assigns the Program Leader. The Program Leader creates a program folder and stores the signed program approval document.

Output: None

Template: None

6.4 Establish Development Team

The Program Leader establishes a Development Team.

Output: Development Team Checklist (Quality Record 7.4)

Template: Development Team Checklist Template

6.5 Create External Interface Document

The Program Leader generates a high level diagram showing interfaces to applicable external mechanical, electrical, software, and facility systems.

Output: External Interface Document (Quality Record 7.5)

Template: External Interface Document Template

6.6 Create Product Requirements and/or Design Specifications

System Product Development

The Product Manager and Program Leader combine the Product Requirements and Design Specifications into a single document.

Electrical Product Development

The Program Leader works with the Product Manager to update or create Product Requirements and/or create Design Specifications as applicable.

Output: Product Requirements and/or Design Specifications (Quality Record 7.6)

Template: Product Requirements and/or Design Specifications Template

6.7 Begin Product Compliance Process for Stage 1

The Program Leader works with Compliance Engineer to begin Product Compliance Process for Stage 1.

Output: None

Template: None

6.8 Complete EHS Analysis

The development team will complete the Environmental Health and Safety Analysis form.

Output: EHS Form (Quality Record 7.8)

Template: EHS Form Template

6.9 Develop High Level Concept(s)

The Development Team generates High Level Concept(s) for critical and/or high-risk sub-systems to meet the combined Product Requirements & Design Specifications.

Output: None

Template: None

6.10 Create High Level Concept(s) Assessment

The Program Leader and Development Team create a document showing concept sketches, criteria with ranking scores, trade-off decisions, and supporting information. If you iterate in this process update the current document instead of making a new document.

Output: High Level Concept(s) Assessment (Quality Record 7.10)

Template: High Level Concept(s) Assessment Template

6.11 High Level Concept(s) Review Meeting

The Development Team reviews and evaluates the High Level Concept(s) Assessment Document. The goal of the meeting is to discuss gaps, areas of improvement, or alternative concepts not identified. If best choice is not apparent, multiple concepts can remain for further analysis in Stage 2. Possible attendees include subject matter experts, development managers, application engineers, staff engineers, etc.

Output: High Level Concept(s) Review Notes (Quality Record 7.11)

Template: High Level Concept(s) Review Notes Template

6.12 Can High Level Concept(s) meet Product Requirements & Design Specifications?

The Program Leader, Product Manager, Hardware Development Manager and Market or Group Product Manager will sign off on this decision.

If No, go to Can High Level Concept(s) Change? (6.16).

If Yes, continue to ensure Product Compliance Process is complete for Stage 1 (6.13).

Output: High Level Concept(s) Signoff (Quality Record 7.12)

Template: High Level Concept(s) Signoff Template

6.13 Ensure Product Compliance Process is Complete for Stage 1

The Program Leader ensures the Product Compliance Process is complete for Stage 2.

Output: None

Template: None

6.14 Create Stage 2 Program Plan

The Program Leader creates a Program Plan that contains the estimates of the required resources (people, time, and budget) to complete Stage 2.

Output: Stage 2 Program Plan (Quality Record 7.14)

Template: Stage 2 Program Plan Template

6.15 Create Stage 2 Request

The Program Leader generates a Stage 2 Request that contains the estimates of the required resources (people, time, and budget) to complete Stage 2 and describes the goals of the Development Program.

Output: Stage 2 Request (Quality Record 7.15)

Template: Stage 2 Request Template

6.16 Can High Level Concept(s) Change?

If No, continue to Can Requirements Change? (6.17).

If Yes, return to Develop High Level Concept(s) (6.9).

Output: None

Template: None

6.17 Can Product Requirements Change?

If No, continue to Document Reason(s) for Program Stop (6.18).

If Yes, return to Create Combined Product Requirements & Design Specification Document (6.6).

Output: None

Template: None

6.18 Document Reason(s) for Program Stop

If the requirements cannot be changed and the high level concept(s) cannot be changed, then the Program Leader documents the reason for program stop. The Program Leader informs the R&D Council that the program will be stopping.

Output: Reason(s) for Program Stop (Quality Record 7.18)

Template: Reason(s) for Program Stop Template

7 Associated Quality Records – as stated in the Quality Records List

	Required Record
7.1	Stage 1 Approval
7.4	Development Team Checklist
7.5	External Interface Document
7.6	Product Requirements and/or Design Specifications
7.8	EHS Form
7.10	High Level Concept(s) Assessment
7.11	High Level Concept(s) Review Notes
7.12	High Level Concept(s) Signoff
7.14	Stage 2 Project Plan
7.15	Stage 2 Request

8 Reference Forms / Templates / Documents

9 Current Revision's Training Requirements

Training requirements are determined by the document owner – either awareness or formal.

Select One (mark X)	Training Type	Training Definition
X	Awareness	Awareness training is conducted by communication, which is sent/delivered by the approver/author/owner of the document to the affected employees/groups.
Hardware Development Team	Formal	Formal training requires the approver/author/owner to collect/store evidence that the affected employees/groups were trained.

10 Revision History & Approval

REVISION HISTORY			
Rev	**Description of Change**	**Author**	**Effective Date**
A	Created	S. Firman	2/17/2009
B	Updated QMS Form	S. Firman	5/10/2010
C	Updated to meet Rev. B of R&D Stage Gate and CE Process	S. Firman	8/27/2012
D	Updated procedure owner, training requirements, and records location	S. Firman	5/17/2013
F	Updated process to better fit Hardware Development objectives.	S. Firman	11-20-2015

APPROVAL OF CURRENT REVISION		
Name / Function	**Signature**	**Date**
Scott Firman, Director of Solutions Engineering		