

# Design, Quality, Testing Education & Training

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SAE Automotive Headquarters  
Troy, Michigan, USA

## **New! Design Review Workshop**

July 1-2, 2013

## **Weibull-Log Normal Analysis Workshop**

August 5-7, 2013

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Live Online  
via telephone/internet

## **Introduction to Design Review Based on Failure Modes (DRBFM) Webinar**

August 12-15, 2013



### **Related Courses Inside**

- Design of Experiments (DOE) for Engineers

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## Design Review Workshop

I.D.# C1306

July 1-2, 2013 ▪ Troy, Michigan

November 7-8, 2013 ▪ Troy, Michigan

**Save on product development costs by using techniques from this course!**

This hands-on seminar describes how formal Design Reviews can be used in conjunction with other new product development methods to improve product designs by uncovering potential problems before they are discovered at a later stage of development or application, when the costs of correction are much higher. A range of effective techniques for organizing and conducting Design Reviews will be presented. Participants will receive specific guidance and tools to assist them in tailoring design reviews to reflect their own organization's requirements. Topics are applicable to a broad range of new product development programs, ranging from components to complete systems, for both OEMs and suppliers.

### Learning Objectives

**By attending this seminar, you will be able to:**

- Describe the relationship of the process to concurrent engineering and knowledge management
- Establish the requirements for a successful Design Review process
- Describe the types and timing of reviews
- Organize a typical Design Review
- Conduct a review and get positive results

### Who Should Attend

This workshop is designed for individuals who are involved in the development of new products and who seek to improve the process. Focus will be on facilitators and leaders for reviews, but will benefit others including: manufacturing, marketing, purchasing, directors, managers, project and program managers, design, development process, product, quality and application engineers.

### Instructor: Angelo Mago

Angelo Mago is a senior consultant and owner of ATM Consulting, Inc., which provides customized training and consulting services to the supplier community in the areas of quality assurance, quality control, design engineering, document management, and customer service and improvement methods. He has over 20 years of experience in product design, quality assurance, management and most recently worked as the Senior Supplier Quality Engineer for GM Truck Group responsible for PPAP qualification and approval. Mr. Mago is a recipient of the Forest R. McFarland Award for distinction in professional development/education. He has a B.S. in Mechanical Engineering from Florida Institute of Technology.



**Fees:** List: \$1,265 ▪ SAE Members – Classic: \$1,135  
Premium: \$1,075 ▪ Elite: \$1,005

**CEUs:** 1.0

For complete seminar content, instructor bio, and to register visit [training.sae.org/seminars/C1306](http://training.sae.org/seminars/C1306)

## Topical Outline

### DAY ONE - DESIGN REVIEW PROCESS

- Why Design Reviews Should be Part of a Product Development Process
  - Market and quality drivers
  - Schedule and cost drivers
  - Litigation considerations
- Outline of the Design Review Process
  - Design reviews as part of an overall risk management process
  - What design reviews are and are not
- Types and Timing of Reviews
  - Concept reviews
  - Preliminary reviews
  - Critical reviews
  - Production readiness reviews
  - Other types of reviews
- Scope of Design Reviews
  - Design review vs gate (or phase) review
  - Formal and informal reviews
  - Key ingredients for a successful review
  - Implementing a DR process

### DAY TWO - DESIGN REVIEW HANDS-ON WORKSHOP

(ends at 12:30)

- Organizing an Effective Design Review
  - Roles during the DR
  - Selecting participants
  - Preparing for the DR
  - Assignments leading to a DR
  - Duration of a review
- Conducting a Design Review
  - Conflict Management
  - Closure and follow-up
  - Using check lists to build organizational knowledge
  - Handling problem participants

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**Now enrolling for Vehicle Electrification (VE) Certificate of Competency and Design Review Based on Failure Modes (DRBFM) Certificate of Competency.**

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# Weibull-Log Normal Analysis Workshop

I.D.# 86034

August 5–7, 2013 ▪ Troy, Michigan

November 4–6, 2013 ▪ Troy, Michigan

This workshop presents special methods developed for these data problems, such as Weibayes, with actual case studies in addition to the latest techniques in SuperSMITH® Weibull for risk forecasts with renewal and optimal component replacement. Class work is used to reinforce key concepts, lectures are based on actual case studies, and personal computers and hands-on experiments are used to analyze dozens of Weibull & Log Normal problems. Students will be fully capable of performing basic and advanced RMS Engineering analysis with their own software on completion of the workshop.

Attendees will receive the entire SuperSMITH® package - a complete self-study course and combined software package containing: SuperSMITH® Weibull, SuperSMITH® Visual, The New Weibull Handbook® - 5th Edition and the PlayTIMETM Tutorial Booklet. A \$960 value!

\*\*\*Attendee must bring laptop for this course.\*\*\*

## Learning Objectives

**By attending this seminar, you will be able to:**

- Analyze design, development, production, and service failures
- Model product lifetime and reliability
- Evaluate calibration and maintainability plans
- Analyze inspection data
- Reduce test substantiation, time and costs

## Who Should Attend

Engineers responsible for reliability, safety, supportability, maintainability, materials, warranties, life cycle cost, design, structures, instrumentation and logistics will find these Weibull techniques extremely useful.

## Instructor: Wes Fulton

Mr. Wes Fulton is the Founder and CEO of Fulton Findings. As a program engineer for aircraft actuation projects he had engineering and management responsibility for the Indigenous Defensive Fighter (IDF) leading edge flap actuation system (LEFAS) development and production, the Rockwell/ MBB X-31A LEFAS flight test program, and the F-16 Fighting Falcon LEFAS production and deployment support. He co-patented a multi-fuseable shaft (high performance drive train device). Additionally, Mr. Fulton has over 20 years of programming experience as a private programmer and developed SuperSMITH® Visual, WeibullSMITHTM, LogNormSMITHTM, Normal+SMITHTM, Visual\*SMITHTM, BiWeibullSMITHTM, and MonteCarloSMITHTM analysis software. He received his M.S.M.E. from California State University at Long Beach.



**Fees:** List: \$2,085 ▪ SAE Members – Classic: \$1,875  
 Premium: \$1,775 ▪ Elite: \$1,665  
**CEUs:** 2.0

For complete seminar content, instructor bio, and to register visit [training.sae.org/seminars/86034](http://training.sae.org/seminars/86034)

## Topical Outline

### DAY ONE

#### UNDERGRADUATE WEIBULL ANALYSIS

- Background, Development & Introduction - 23-Minute Video Short Course
- How to do Weibull Analysis
- Interpretation of Good Weibulls - 2 & 3 Parameter
- Are two Weibull datasets significantly different?
- Interpretation of Bad Weibulls
- Failure Predictions and Weibull Risk Analysis
- Case Studies, Failure Forecasting
- Weibull Experiments (Wire Rupture, Torsion, LCF, Accelerated Testing), Classwork Problems and Solutions

### DAY TWO

#### POSTGRADUATE WEIBULL ANALYSIS

- Maximum Likelihood Weibull Theory and Application
- WeiBayes Analysis
- Dauser Shift, Warranty Analysis
- Rank Regression vs. Maximum Likelihood
- Extremely Small Samples Analysis
- Log Normal Analysis
- Predicting Future Failures With & Without Renewals
- One Failure Weibull Case Study
- An Introduction to SuperSMITH® Software, Features, Input, Analysis, Output
- Summary of Weibull Methods
- Class Work Problems
- Experimental Wire Data Distribution Analysis
- Optimal Replacement Intervals, Block Replacement
- Playtime With SuperSMITH® Tutorial
- Ph.D. Oral Examination

### DAY THREE

#### CONFIDENCE INTERVALS AND SYSTEM MODELS

- Confidence Intervals, “The Good, The Bad and The Complicated”
- Comparing Designs
- The Binomial & Poisson, The Thorndike Chart
- Duane-AMSAA Reliability Growth Modeling - New Useful Technology for Tracking Development Testing
- The Exponential Related to the Poisson and the Weibull
- Kaplan-Meier Survival Analysis (Now Included in SuperSMITH® Weibull)
- Duane-AMSAA Employed for Analyzing Renewal-Repairable Systems
- System Models
- Classwork
- Complete Playtime With SuperSMITH®

## Related Seminar

### Design of Experiments (DOE) for Engineers

**I.D. #C0406 • June 24-25, 2013 • Troy, Michigan**

This seminar utilizes hands-on activities to help you learn the criteria for running a DOE, the requirements and pre-work necessary prior to DOE execution, and how to select the appropriate designed experiment type to run. You will experience setting up, running, and analyzing the results of simple-to-intermediate complexity, Full Factorial, Partial Factorial, and Response Surface experiments utilizing manual methods as well as a hands-on computer tool that facilitates experimental design and data analysis.

**Fees:** \$1,305 **Classic Members:** \$1,175

**Premium Members:** \$1,105; **Elite Members:** \$1,045

*For complete seminar content, instructor bio and to register visit*  
[training.sae.org/seminars/C0406](http://training.sae.org/seminars/C0406)

# Introduction to Design Review Based on Failure Modes (DRBFM) Webinar

August 12, 13, & 15 2013 ▪ via telephone/internet

I.D.# WB1047

This Webinar will explain all phases of the DRBFM methodology and provide details on how to accomplish the specific steps. With the Design Review Based on Failure Modes (DRBFM) and Design Review Based on Test Results (DRBTR) Process Guidebook that is bundled with the course, the instructor will provide specific information on each step. Formats, examples, notes and homework slides will be used to illustrate the defined steps of the new SAE J2886 DRBFM Recommended Practice. Similarities in content between DRBFM and FMEA will be discussed, however the focus will be on conducting DRBFM methodology.

## Learning Objectives

**By attending this seminar, you will be able to:**

- Outline the fundamental steps of DRBFM methodology, including: DRBFM Plan and analysis requirements; Necessary preparation feeding DRBFM analysis; The two phases of DRBFM analysis; Documentation of design, validation and manufacturing actions; Feedback loop into engineering knowledge documents
- Explain the intent and format of the DRBFM worksheets
- Predict what it takes to gain and maintain proficiency and consistent application of the methodology
- Find answers to most DRBFM questions

## Who Should Attend

Product engineers, manufacturing engineers, quality engineers, supplier quality engineers, validation and test engineers, and facilitators, trainers and consultants in all industries. This webinar will benefit beginning engineers, advanced and senior engineers and managers who must participate in FMEA's and DRBFM.

## Instructor: Bill Haughey

Bill Haughey is a respected consultant and instructor in the areas of Failure Modes Effects Analysis, Design for Manufacturability and Assembly, Design Review Based on Failure Modes, Design Review Based on Test Results, and other GD3 methodologies. He is a current member of the issuing committee of the SAE J1739 FMEA standard, SAE Automotive Quality and Process Improvement Committee; the SAE Automotive Electronic Systems Reliability Standards Committee; and the AIAG FMEA Fourth Edition Recommended Practice Committee. Mr. Haughey was recently approved to lead the development of a new SAE DRBFM Recommended Practice (J2886). Mr. Haughey received a B.S. degree from the University of Michigan and M.S from Central Michigan University, and has the following certifications: Black Belt in GD3 (DRBFM and DRBTR); Master Design for Manufacturability and Assembly Engineer; and Certified Internal Auditor.



**Fees:** List: \$595 ▪ SAE Members – Classic: \$536  
Premium: \$506 ▪ Elite: \$476  
**CEUs:** 0.6

For complete seminar content, instructor bio, and to register visit [training.sae.org/webinars/WB1047](http://training.sae.org/webinars/WB1047)

## Topical Outline

### SESSION 1

- DRBFM Procedure, Forms, Planning and Preparation
  - Process Guide and Workbook Overview
  - Scope and Purpose
  - Process Map – General Requirements
  - Planning – Formats, examples, homework
- Planning Results and Output
- Preparation – Formats, examples, homework
- Preparation Results and Linkage with DRBFM Format
- Definition of Change Section

### SESSION 2

- DRBFM – Forum 1, Design Review, Action Results and Follow Up
  - DRBFM Forum 1 – Engineer analysis
  - Change Point definition
  - Identification of concerns
  - Identification of causes and influences on the vehicle
- Identification of effects
- Identification of severity/priority
- Actions to gain engineering knowledge – evidence

### SESSION 3

- DRBFM – Forum 2, Design Review, Action Results and Follow Up
  - DRBFM Forum 2 – Design Review introduction
  - Change Point overview
  - Identification of additional concerns
  - Identification of additional causes and influences on the product
  - Identification of effects
  - Identification of severity/priority
- Actions taken to eliminate concerns
- Design actions to gain engineering knowledge – evidence
- Validation actions to gain evidence of reliability
- Manufacturing, assembly, and supplier actions
- Action results and feedback to design guidelines
- Roles and responsibilities

## To Register



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**Web:** [training.sae.org/seminars](http://training.sae.org/seminars)

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**Condition of Sale:** If you cannot attend, you may send a substitute or transfer to a future offering. The member discount may be adjusted based on the substitute's SAE membership level. A full refund is issued if you notify SAE at least 14 days prior to seminar start date. If canceled less than 14 days prior, the full fee is charged. For \$50, you may process a one-time transfer to a future offering within one year of canceled seminar. Canceling may reduce group discounts. For the SAE membership registration rates, member dues must be current at the start of the event.

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