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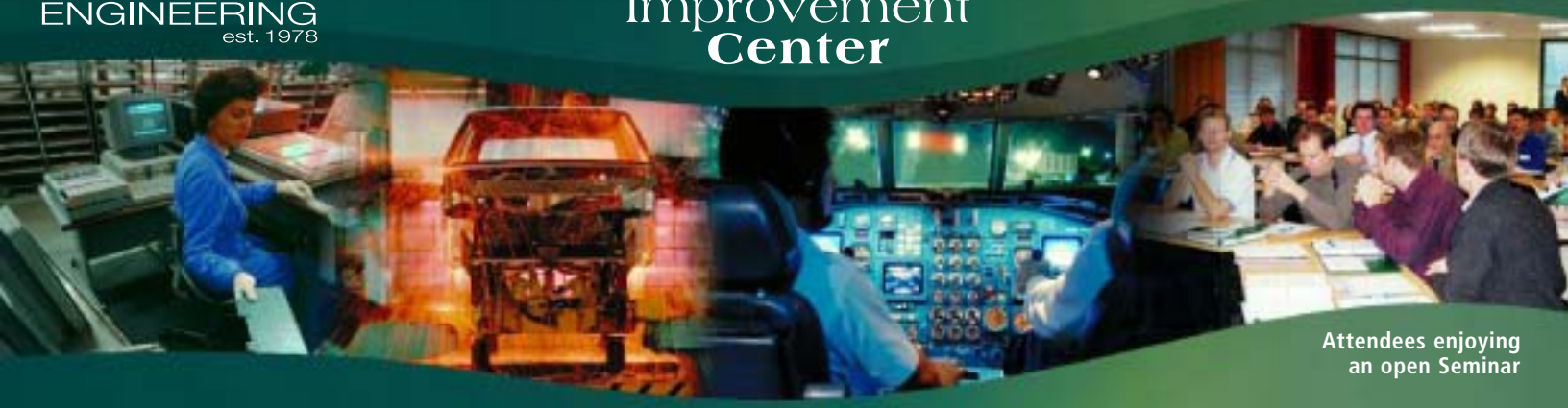
The Reliability Improvement Center



Attendees enjoying an open Seminar

HALT&HASS + WORKSHOP

HALT and HASS seminars are presented by the Inventor of HALT & HASS, Gregg K. Hobbs, Ph.D., P.E.

Hobbs Engineering offers how-to seminars on accelerated reliability presented by recognized leaders in their respective fields.

These are the famous seminars that teachers, engineers and managers have been speaking about.

Hobbs Engineering Corporation
4300 W. 100th Avenue
Westminster, CO 80031 USA
Tel 303-465-5988 FAX 303-469-4353
E-Mail: learn@hobbsengr.com Web: www.hobbsengr.com

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ALL SEMINARS ARE PRESENTED IN ENGLISH

The Workshop will use a HALT & HASS Systems Corporation Time Compressor™ Chamber

INTRODUCTION

Unlike the typical equipment manufacturer's HALT and HASS seminar that simply expounds success stories and testimonials, this course actually teaches the latest techniques. Taught by the inventor of HALT and HASS, we begin with the science behind why it works, provide the hard engineering and physics, and explain why the failures accelerated through higher stress levels are essential to developing reliable products. The course offers step-by-step instruction on why, how, and when to perform HALT, how to correctly set-up and tune HASS profiles on production units, and how to prove that the HASS profiles leave enough life left, so the products can be confidently sold to customers.

CONTENT

You will learn how to vastly improve design margins and eliminate process problems using the highly accelerated techniques taught by their originator. Emphasis is placed on environmental and other stress stimulation methods applied in the design phase in order to force accelerated design and process maturity using HALT. This allows earlier product introduction and obtains very robust design margins, leading to greater field reliability. Emphasis is also given to the application of HASS during the production phase to insure process and design control.

The second day of the class provides greater depth in stimulation, precipitation and detection methods and covers advanced HASS optimization and methods for doing production HASS on high volume products on a sample basis. Information is also provided that can help engineers "SELL" the program to upper management. Case studies are presented as learning experiences on how to perform HALT and HASS correctly; and sufficient time is spent discussing customized approaches for product samples brought to the seminar by attendees. The majority of attendees leave the seminar equipped with the ability to implement their own HALT and HASS programs. During the afternoon of the second day, RAPID HALT is taught in a hands-on workshop using a HALT & HASS chamber.

RapidHALT™, introduced in 2003, has reduced the time in HALT substantially. HyperHALT™ was introduced in 2007.

WHO SHOULD ATTEND

HALT&HASS + Workshop is appropriate for managers, executive officers, design engineers, quality & reliability engineers, and production staff involved in Highly Accelerated Stress Screening including failure analysis. RAPID HALT, as demonstrated in the workshop. is appropriate for any staff involved in actually performing or evaluating the HALT & HASS activities. Some high level managers will want to attend only the first few hours which is a Management Overview.

BENEFITS

Participants have reported substantial benefits:

Return on investment of 50:1 in the first year!

Dramatically increased field reliability, 838 times improvement in one case!

Greatly reduced warranty and field retro-fitting costs!

Reduction of product development time!

Reduced time to market!

Virtual elimination of field failures!

One company reported a savings of $30 million in one year!

Another company reported savings of over $200 million in three years!

Reduction in REL-DEMO costs by orders of magnitude!

Substantial savings in manufacturing costs! Almost no scrap and rework!

Vast reduction in screening and test equipment costs!

Elimination of "No Defects Found" in field returns!

INSTRUCTOR

Gregg K. Hobbs, Ph.D., a Registered Professional Engineer in California in Mechanical Engineering, Civil Engineering, and Control System Engineering, is **the originator of and world leader in the principles of HALT and HASS**. He has been a consulting engineer since 1978, specializing in the fields of stress screening, robust and flaw tolerant design, dynamic analysis, and testing. He has been employed as a consultant by many leading companies and has taught at two major universities as Visiting Full Professor. He has taught courses on these subjects in the USA, Asia, Canada, Europe, the UK, Africa, the South Pacific, Middle-East and Mexico. He has introduced, and continues to introduce, many new concepts, techniques, and equipment that have been proven by 36 years extensive use on many products, resulting in the savings of several billions of dollars. He has acted as "facilitator" for companies beginning to use these methods and has led teams that enhanced designs using the techniques, selected equipment, and then developed production screens. Dr. Hobbs is the inventor of 14 patents on accelerated testing equipment, with several more pending.

Dr. Hobbs has shown thousands of engineers throughout the world how to improve the quality of their products through the application of his HALT&HASS techniques. Significant improvements are still being made in the HALT&HASS equipment design and methodologies by Dr. Hobbs.

He formed HALT&HASS Systems Corporation to design and build Time Compression™ chambers based upon this vast experience and knowledge.

COURSE OUTLINE

HALT & HASS

INTRODUCTION

Overall HALT & HASS processes from start to finish in one slide.

Origin of the methods and how they developed through the years.

Load-Strength relationships and how they relate to failures in the field.

Modulated Excitation, the great detector, and why it should be used.

Crossover Effect—a very important concept and one frequently missed.

Some examples of the Crossover Effect.

The Bathtub Curve and how HALT & HASS change it.

Stresses used for particular applications and in general.

Various methods in "success" and "discovery" testing.

Discipline interactions in HALT & HASS.

Some failure modes and mathematical expressions of them.

Definition of terms for operational and destruct limits.

Basic application of HALT & HASS and how to perform them.

Why 6 Sigma will work well only after HALT.

What the operational and destruct limits look like on a chart.

Where to stop improving the product in a logical way.

Proper selection of stresses for HASS profile for a particular case using the HALT data.

Seven basic parts of HALT & HASS.

Comparisons of philosophies of Mil-Spec and accelerated methods.

Benefits of HALT & HASS.

Comparisons of costs when vibration and thermal stresses are increased.

Some successes from various fields.

Summary of Management Overview.

HALT IN DETAIL

Substituting stress level for sample size.

Major mistakes made by many and how to avoid them.

How many samples would be necessary at field stress levels?

How to find the limits. Only the first step! Improvement is the desired step.

Guidelines in step stress testing for beginners and experienced engineers.

Some very important points missed by many that have led to disasters.

Margins obtained in graphical representation and how distributions affect them.

A few critical guidelines for vibration and why they must be followed.

How four-corner testing without modulated excitation can lead to disaster.

HALT on super fast track products, some examples.

How to become "product smart" and not forget the lessons learned.

How many units to HALT and when.

Uses for HALT units.

Assembly levels on which to perform HALT and why.

Where to perform HALT.

Where should one stop and why.

Comparison of the classical and HALT spending rates over time.

HALT process flow diagram.

Disciplines required to perform HALT.

Lessons learned database.

Some disastrous mistakes made by many in a HALT program.

HASS

Some screens used on parts, assemblies and systems.

Selecting the stress magnitudes from the HALT results.

Precipitation and Detection screens and why.

Examples of what was found in some detection screens and why.

What a good HASS profile must do.

Progressing to a sample—HASA (Highly Accelerated Stress Audit).

Some products HASSed.

PROOF OF HASS – very important

Safety of HASS and why it must be performed.

How to perform Safety of HASS.

Why not to run the product to end of life to prove Safety of HASS.

HASS Effectiveness and why it should not be performed.

HASS OPTIMIZATION

How to optimize profiles for minimum cost and maximum effectiveness.

Several examples of optimization.

Convergence.

Some incorrect approaches to selecting screens and why they have led to disasters of large scale.

The "typical HASS profile."

How to achieve solder joint creep failure and how not to.

Why tight uniformity and repeatability are not generally necessary.

Examples from the literature.

PHYSICS OF FAILURE

Why things fail and how.

Main activities of Physics of Failure.

Some examples showing time compression and flaws detected.

SOFTWARE HALT™ – Fault insertion to determine coverage and resolution and improve them.

Insertion types and pros and cons of each.

Results for a few products.

Shipped defect levels as a function of coverage and yield for PCBs.

Automated Signal Integrity Testing.

Time domain reflectometry.

EQUIPMENT NECESSARY for HALT & HASS

Vibration Systems – pros and cons.

Thermal Systems – pros and cons.

Cost impact of selections is very large, maybe even critical.

A few considerations of failure modes and how to excite them.

Probability distributions of the various shakers available.

Use of pseudo products for control in order to speed screens.

Comparison of compressor and LN2 systems.

Vendor selection, a very critical and long lasting decision.

Some use examples from industry.

CONCLUSIONS, RECOMMENDATIONS AND PITFALLS TO AVOID

Ways of accomplishing the goals.

Proof of Concept.

Getting management to accept HALT & HASS.

Examples of some failures to convince and why they occurred.

Other uses of HALT.

A checklist on performing your own HALT or for grading others.

Outsourcing—the double-edged sword!

Pitfalls to avoid in HALT & HASS.

How to perform HALT & HASS on attendees' products.

RAPID HALT, HANDS-ON WORKSHOP

Demonstration of RAPID HALT on a live product using a HALT&HASS SYSTEMS CORPORATION Time Compressor™ chamber.

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ACCELERATED RELIABILITY SEMINARS AVAILABLE FOR OPEN, IN-HOUSE, AND CONSULTING

WORLD CLASS INSTRUCTORS

RELIABILITY UNDERSTANDING CLASSES

Practical Reliability Engineering - 2 days	Chet Haibel, M.S.E.E.
HALT&HASS + Workshop - 2 days	Gregg Hobbs, Ph.D., P.E.
Developing a Reliability Program Plan - 1 day	Larry Edson, BSME, CQE
Demonstrating Reliability with Accelerated Testing - 2 days	Larry Edson, BSME, CQE
Advanced Applications in Accelerated Testing - 1 day	Larry Edson, BSME, CQE
Accelerated Test Data Analysis - 4 days	Wayne Nelson, Ph.D

SPECIFIC TECHNICAL CLASSES

Physics of Failure - 2 days	Abhijit Dasgupta, Ph.D.
Lead-Free Solder Joint Reliability - 2 days	Jean-Paul Clech, Ph.D.
Preventing Vibration & Shock Failures - 2 days	Prof. Dave Steinberg, P.E.
Preventing Thermal Cycling & Vibration Failures - 2 days	Prof. Dave Steinberg, P.E.
Cooling Techniques for Electronic Equipment - 2 days	Prof. Dave Steinberg, P.E

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Registration Information
Contact Hobbs Engineering.
Cost: AUS $1,195 (Workshop only for past attendees $200)
Check, Visa, and Mastercard accepted.
Payment is due by the seminar date.