

Mastering HALT and HASS

Advanced Reliability Improvement Workshop

Accelerated Reliability Solutions, LLC

This advanced engineering workshop provides a practical and real-world framework for discovering hidden reliability weaknesses using Highly Accelerated Limit Testing (HALT), Highly Accelerated Stress Screening (HASS), environmental stress methods, and physics-of-failure based reliability development.

Course Overview

- Traditional reliability prediction models and MTBF calculations often fail to identify real-world causes of electronic system failures during product development and manufacturing.
- This workshop focuses on accelerated stress methodologies used to discover latent weaknesses, improve robustness, reduce field failures, and accelerate design maturity in electronic systems.
- Participants will learn practical implementation approaches for HALT, HASS, HASA, and related environmental stress methods based on decades of industry experience and real-world case histories.

Learning Objectives

- Understand the principles and objectives of accelerated step stress testing
- Recognize the limitations of traditional reliability prediction methodologies
- Identify common electronic failure mechanisms and their relationship to environmental stress
- Apply HALT and HASS methodologies to improve product robustness
- Develop environmental stress profiles for electronic hardware and systems
- Distinguish between common-cause and special-cause failures
- Interpret stress test results to support corrective action and reliability growth
- Understand how thermal stress can stimulate intermittent hardware and software-related failures

Workshop Topics

Traditional Reliability Engineering History

- History of reliability prediction models and formulas
- Limitations of prediction-based development approaches
- Why real-world failure data and HALT case histories are limited

Failure Mechanisms and Environmental Stress

- Wear-out mechanisms in electronics

- Acceleration of fatigue damage and aging
- Thermal, vibration, voltage, and combined stress methods
- System-level stress interactions

HALT Philosophy and Organizational Adoption

- Changing from prediction to weakness discovery
- Simulation versus stimulation
- Overcoming skepticism and organizational resistance

Highly Accelerated Life Testing (HALT)

- Determining appropriate stress levels
- Step stress methodologies
- Single and combined stress approaches
- Data collection and analysis methods
- Required equipment and personnel

Highly Accelerated Stress Screening (HASS) and HASA

- Development of production stress screening profiles
- Proof-of-screen methodologies
- Highly Accelerated Stress Audits
- Optimization of manufacturing screening

Thermal HALT and Signal Integrity Issues

- Thermal skewing of device parametrics and timing
- Discovery of intermittent firmware and software failures
- Hardware manufacturing variations and signal propagation effects

Applications and Case Histories

- Supplier benchmarking
- Intermittent failure discovery
- Real-world HALT and HASS success stories
- Long-term reliability improvement strategies

Intended Audience

- Reliability Engineers
- Design Engineers
- Quality Engineers
- Manufacturing Engineers
- Test Engineers
- Product Development Teams

- Technical Managers and Program Leaders

Delivery Formats

- On-site instructor-led workshops
- Virtual live training
- Customized corporate seminars
- Integrated consulting sessions

Instructor Background

Kirk A. Gray, BSEE, IEEE Senior Life Member, has more than 40 years of experience in electronics manufacturing, accelerated reliability testing, and product development. He worked closely with Dr. Gregg K. Hobbs, originator of HALT and HASS methodologies, at Storage Technology and QualMark.

Kirk is co-author of the Wiley-published book "Next Generation HALT and HASS: Robust Design of Electronics and Systems" and has helped organizations significantly reduce warranty returns and improve manufacturing screening effectiveness through practical accelerated reliability methods.

Contact Information

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